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BULLETIN

OF THE

UNITED STATES NATIONAL MUSEUM.

NO. 7.—CONTRIBUTIONS TO THE NATURAL HISTORY OF THE HAWAIIAN AND FANNING ISLANDS AND LOWER CALIFORNIA.

BY

THOS. H. STREETS, M. D.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1877.

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— 7 —

BULLETIN

OF THE

UNITED STATES NATIONAL MUSEUM.

No. 7.

PUBLISHED UNDER THE DIRECTION OF THE SMITHSONIAN INSTITUTION.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1877.

ADVERTISEMENT.

This work is the seventh of a series of papers intended to illustrate the collections of natural history and ethnology belonging to the United States and constituting the National Museum, of which the Smithsonian Institution was placed in charge by the act of Congress of August 10, 1846.

It has been prepared at the request of the Institution, and printed by authority of the honorable Secretary of the Interior.

JOSEPH HENRY,
Secretary of the Smithsonian Institution.

SMITHSONIAN INSTITUTION,
Washington, April, 1877.

CONTRIBUTIONS

TO THE

NATURAL HISTORY

OF THE

HAWAIIAN AND FANNING ISLANDS

AND

LOWER CALIFORNIA,

MADE IN CONNECTION WITH THE UNITED STATES NORTH PACIFIC
SURVEYING EXPEDITION, 1873-75.

BY

THOS. H. STREETS, M. D.,
PASSED ASSISTANT SURGEON, U. S. NAVY.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1877.

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PREFACE.

The collections that furnished material for this bulletin* were made, one in 1873–74, by Surgeon William H. Jones, U. S. N., and the writer, while serving on board the United States ship Portsmouth, Commander Joseph S. Skerrett commanding, engaged in the survey of the islands of the North Pacific Ocean; and the other by the writer alone, in 1874–75, while on board the United States steamer Narragansett, Commander George Dewey commanding, engaged in the survey of the coasts of the peninsula of Lower California.

The first collection very well represents the fish-fauna of the harbor of Honolulu and the avi-fauna of the Fanning group. While among the latter islands, our means for the preservation of specimens were too limited to permit of a very extensive collection of fish. A complete botanical collection was made at Palmyra and Christmas Islands. The plants were sent home from the Pacific; and before I arrived there to commence the work of arranging the collection, they had been identified by Prof. A. Gray, and distributed through the general collection of the Agricultural Department at Washington, so that it was impossible to get a list of them except by overhauling the entire collection. The present list, therefore, represents little more than the duplicate series. I am indebted to Prof. Gray and Dr. Vasey, Botanist of the Agricultural Department, for the notes accompanying the list of plants from Lower California.

The Fanning group, with the exception of the Hawaiian, were the only islands visited in the Pacific. This group comprises the islands of Christmas, Fanning, Washington, and Palmyra. They are situated immediately north of the equator from latitude 1° 57′ to 5° 49′, and extend from longitude 157° 27′ W. to 162° 11′ W. Palmyra is the most northern and western, and Christmas the most southern and eastern of the group. From these two came the largest part of our collection. They are uninhabited, save by parties that go there to harvest the crop of cocoanuts. They are exclusively coral formations; and all except Christmas are well clothed with vegetation, and are frequently visited by rains.

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* Excepting the Crustaceans, the invertebrate portion of the collection is excluded from this bulletin.

In regard to the Lower Californian collection, it by no means represents either the fauna or flora of any place or section. The specimens were collected all along the coasts—our stay at any one place being too short to admit of more than a mere cursory examination of its life.

I regret to say that a large collection of birds' eggs from Palmyra and Christmas Islands was completely destroyed by rats on board the ship.

To Dr. Elliott Coues, U. S. A., belongs the credit of the identification of the birds, and he has very kindly furnished me with the notes accompanying that portion of the ornithological collection from the Californian peninsula. I desire to express, in this connection, my obligations to Prof. T. Gill for assistance in the classification of the fishes, and for his advice in other matters relating to my ichthyological work. To both these eminent gentlemen I tender my sincere thanks.

T. H. S.

SMITHSONIAN INSTITUTION,
Washington, D. C., April, 1877.

ORNITHOLOGY.

SYLVICOLIDÆ.

DENDRŒCA AUDUBONI, (*Towns.*) *Bd.* [No. 70632].

Sylvia audubonii, TOWNS., Jour. Acad. Nat. Sci. Phila., vii, 1837, 190.

Sylvicola audubonii, BP., List, 1838, 21.—AUD., B. Am., ii, 1841, pl. 77.

Dendrœca audubonii, BD., B. N. A., 1858, 273.—COUES, Key, 1872, 100; Birds Northwest, 1874, 58.—BD., BREW., & RIDG., N. A. Birds, i, 1874, 229, pl. xiii, f. 1.

Locality: mouth of the Colorado River. Immature plumage; throat scarcely tinged with yellow. One specimen.

FRINGILLIDÆ.

PASSERCULUS SAVANNA ALAUDINUS, (*Bp.*) [No. 70633].

Passerculus alaudinus, BP., Comp. Rend., xxxvii, 1853, 918.—BD., Birds N. A., 1858, 446.

Passerculus savanna alaudinus, BD., BREW., & RIDG., N. A. Birds, i, 1874, 537, pl. xxiv, f. 11.—HENSHAW, Wheeler's Exped., vol. v, 1875, Zoöl., 254.

Passerculus savanna, ALLEN, Bull. Mus. Comp. Zoöl., 1872, 177.—COUES, Birds Northwest, 1874, 127 (in part).

Locality: San Ignacio River, Sonora, Mexico. One specimen. Flew aboard the ship while at anchor, and was captured.

PASSERCULUS SAVANNA ANTHINUS, (*Bp.*) *Cs.* [No. 70634].

Passerculus anthinus, BP., Comp. Rend., xxxvii, 1853, 919.

Passerculus savanna anthinus, COUES, Key, 1872, 136.—BD., BREW., & RIDG., N. A. Birds, i, 1874, 539, pl. xxiv, f. 10.—COUES, Birds Northwest, 1874, 128.

Locality: Todos Santos Islands, Pacific coast of Lower California. One specimen.

PASSERCULUS ROSTRATUS, (*Cass.*) *Bd.* [No. 70635].

Emberiza rostrata, CASSIN, Proc. Acad. Nat. Sci. Phila., vi, 1852, 348.

Ammodramus rostratus, CASSIN, Ill. B. Cal. Tex., &c., i, 1855, 226, pl. 38.

Passerculus rostratus, BAIRD, Birds N. Am., 1858, 446.—BD., BREW., & RIDG., N. A. Birds, i, 1874, 542, pl. 24, f. 12.—COUES, Key, 1872, 136.

Locality: Todos Santos Islands. One specimen. Inseparable from typical *rostratus* of Southern and Lower California (mainland), though rather larger (wing 2.80, instead of about 2.50; tail 2.10, instead of about 1.90). The peculiar turgid shape of the bill and its light-brown color, together with the special light reddish-brown tone of all the markings of *rostratus*, are repeated with fidelity.

PASSERCULUS GUTTATUS, *Lawr.* [Nos. 70636, 70637].

Passerculus guttatus, LAWRENCE, Ann. Lyc. New York, viii, 1867, 473.
Passerculus rostratus var. *guttatus*, B., B., & R., N. A. Birds, i, 1874, 544.

Resembling *P. rostratus* in the great size of the bill, but with that member of a decidedly different shape. In *P. rostratus*, the shape of the bill is peculiar in the genus, and very much resembles that of a *Pyranga* in its turgidity, the convexity of the culmen throughout, and other features. In *P. guttatus*, the shape of the bill is as in the *Passerculi* generally, but its size is relatively greater. Culmen 0.50 of an inch long, about straight; depth of bill at base 0.22–0.30. Most or all of the upper mandible black; the lower yellowish, with dusky point. System of coloration as in other *Passerculi;* the loral line only just appreciably tinged with yellowish; yellow of bend of wing obsolete. General coloration much as in *P. savanna*. Length, as well as can be judged, about 5.75 inches; wing 2.75; tail 2.10; tarsus 0.85; middle toe and claw 0.80; bill as already given.

Two specimens from San Benito Island, Pacific coast of Lower California.

This well-marked form has been referred [Check List, No. 160 *a*; B., B., & R., i, p. 544] to *P. rostratus* as a geographical or local race. Its relationships seem rather to be with *P. sandvicensis*, however, there being very little difference in color, while there is more resemblance to this species in form than to *P. rostratus*. Upon the whole, we are inclined to consider it a good species. The only other specimen that has been obtained is in the National Museum. It came from San José del Cabo.

SPIZELLA BREWERI, *Cass.* [No. 70638].

Emberiza pallida, AUD., Orn. Biog., v, 1839, 66, pl. 398, f. 2; Birds Am., iii, 1841, 71, pl. 161 (*nec* SWAIN).
Spizella pallida, BONAP., Consp. Av., i, 1850, 480.
Spizella breweri, CASSIN, Proc. Acad. Nat. Sci. Phila., viii, 1856, 40.
Spizella pallida breweri, COUES, Key, 1872, 143; Birds Northwest, 1874, 151.—BD., BREW., & RIDG., N. A. Birds, ii, 1874, 13, pl. 27, f. 4.

Locality: Angel Island, Gulf of California. One specimen.

ZONOTRICHIA LEUCOPHRYS INTERMEDIA, *Ridgw.* [No. 70639].

Zonotrichia gambeli, BD., Birds N. A., 1858, 460.
Zonotrichia leucophrys var. *gambeli*, COUES, Key N. A. Birds, 1872, 145 (in part).
Zonotrichia intermedia, YARROW, Rep. Orn. Specs., 1871, Wheeler's Exped., 1874, 35.
Zonotrichia leucophrys var. *intermedia*, RIDGW., MS.—HENSHAW, Wheeler's Geograph. and Geol. Expl. and Surv. West of the 100th Merid., v, 1875, Zoöl., 261, pl. 7, f. 1, 2.

Locality: Los Coronados Islands, near San Diego, Cal.

CALAMOSPIZA BICOLOR, (*Towns.*) *Bp.* [Nos. 70640, 70641, 70642].

Fringilla bicolor, TOWNSEND, Jour. Acad. Nat. Sci. Phila., vii, 1837, 189.
Calamospiza bicolor, BP., List, 1838, 30.—BD., Birds N. Am., 1858, 492.—COUES, Key, 1872, 147; Birds Northwest, 1874, 163.—BD., BREW., & RIDG., N. A. Birds, ii, 1874, 61, pl. 29, f. 2, 3.
Corydalina bicolor, AUD., Syn., 1839, 130.
Dolichonyx bicolor, NUTT., Man., i (2d ed.), 1840, 203.

Localities: Angel Island and Pichilinque Bay, Gulf of California. Three specimens.

GONIAPHEA MELANOCEPHALA, (*Sw.*) *Gray* [No. 70643].

Guiraca melanocephala, SW., Philos. Mag., i, 1827, 438.—BD., Birds N. Am., 1858, 498.
Coccothraustes melanocephalus, RICH., Pr. Brit. Assoc. for 1836 (1837).
Pitylus melanocephalus, GRAY, Gen. of Birds, ii, 362.
Fringilla melanocephala, AUD., Orn. Biog., iv, 1838, 519, pl. 373.
Coccoborus melanocephalus, AUD., Syn., 1839, 133.
Hedymeles melanocephalus, CAB., Mus. Hein., i, 1851, 153.—BD., BREW., & RIDG., N. A. Birds, ii, 1874, 73, pl. 30, f. 1, 2.
Goniaphea (*Hedymeles*) *melanocephala*, GRAY, Hand-list, No. 7547.
Goniaphea melanocephala, COUES, Key, 1872, 149; Birds Northwest, 1874, 167.
Fringilla xanthomaschalis, WAGL., Isis, 1831, 525.

Locality: Pichilinque Bay, near La Paz. One specimen.

CORVIDÆ.

CISSILOPHA SANBLASIANA, (*Lafr.*) *Bp.* [No. 70644].

Geai de San Blas, NÉBOUX, Rev. Zool., 1840, 290, 323.
Pica sanblasiana, LAFR., Mag. de Zool., 1842, Ois., t. 28.
Cyanocorax de San-Blas, PREV. & DES MURS, Voy. Vénus, v, 200.
Cissilopha sanblasiana, BP., Consp., i, 380.—LAWRENCE, Mem. Boston Soc. Nat. Hist., ii, 284.
" *Cyanurus geoffroii*, BP.", Gray, Hand-list, ii, 4.
Cyanocitta sanblasiana, SCL. & SALV., Proc. Zoöl. Soc. London, 1876, 269.

Locality: Mita Point, Sinaloa, Mexico. One specimen. Identical with unquestioned examples of this species, except in the lack of any decided crest, though the feathers of the part are somewhat full. Bill jet-black, and the feet are blackish. In this and various allied jays of the black-bellied section of the genus *Cyanocitta*, it appears that the bill, and even the feet, may be indifferently either yellow or black. The *C. crassirostris* Bp. was separated from *C. beecheyi* partly on account of its black instead of yellow bill, but has, however, other and better specific characters.

TYRANNIDÆ.

TYRANNUS VOCIFERANS, *Sw.* [No. 70645].

Tyrannus vociferans, Sw., Quart. Jour. Sci., xx, 1826, 273.—Bd., Birds N. Am., 1858, 174.—Coues, Key, 1872, 170, f. 110^d.—Bd., Brew., & Ridg., N. A. Birds, ii, 1874, 327, pl. 43, f. 5.—Coues, Birds Northwest, 1874, 238.

Laphyctes vociferans, Cab., Mus. Hein., ii, 1859, 77.

Tyrannus cassini, Lawr., Ann, Lyc. New York, v, 1852, 39, pl. 3, f. 2.

Locality: Bay of Santa Tomas, Pacific coast of Lower California. One specimen.

MYIARCHUS CINERASCENS, (*Lawr.*) *Scl.* [No. 70646].

Tyrannula cinerascens, Lawr., Ann. Lyc. New York, v, 1851, 109.

Myiarchus cinerascens, Scl., Ibis, 1859, 121.—Coues, Key, 1872, 171; Birds Northwest, 1874, 239.

Myiarchus crinitus cinerascens, Bd., Brew., & Ridg., N. A. Birds, ii, 1874, 337, pl. 43, f. 6.

Myiarchus mexicanus, Bd., Birds N. Am., 1858, 179 (nec Kaup; nec Lawr., Ann. Lyc. New York, ix, 1869, 202).

Myiarchus mexicanus pertinax, Bd., Proc. Acad. Nat. Sci. Phila., 1859, 303.

Locality: Pichilinque Bay, Lower California. One specimen of the slightly broader bill form noticed by Baird from Cape San Lucas under the name of var. *pertinax*.

ARIDÆ.

CHRYSOTIS FINSCHI, *Sclat.* [No. 70647].

Chrysotis finschi, Sclat., Proc. Zoöl. Soc., 1864, 298.—Finsch, Die Papageien, ii, 1868, 543.

Chrysotis viridigenalis var., Gray, List Psitt., 1859, 82.

Chrysotis viridigenalis, Souancé, Icon. Perr., t. 31 (upper fig.) sine descr.

Locality: Mita Point, Sinaloa, Mexico. One specimen. Agreeing perfectly with labeled specimens in the National Museum.

TRICHOGLOSSIDÆ.

CORIPHILUS KUHLI, (*Vigors*) *Wagler* [Nos. 67314, 67358, 67333].

Psittacula kuhli, VIGORS, Zoöl. Jour., 1824, 412, pl. 16.
Psittacus kuhli, LESS., Voy. Coq., 1828, 629.
Lorius kuhli, LESS., Tr. d'Orn., 193.
Vini coccineus, LESS., Ill. de Zool., 1832, t. 28.
Coriphilus kuhli, WAGLER, Mon., 566.
Psittacula interfringillacea, BOURJ., Perr., t. 83.
Brotogeris kuhli, SWS., Class. of Birds, ii, 303.
Domicella kuhli, FINSCH, Die Papageien, ii, 1868, 749.

Locality: Washington Island, Fanning group, North Pacific Ocean. Three specimens.

This bird is so rare in museums that a technical description of it will not be out of place in this connection. Bill short and stout, slightly shorter than the tarsus; upper mandible much hooked; tarsus and feet short and stout. The under surface of the neck and extending half-way around on the sides, the side of the head below the eyes, the breast, and the abdomen bright scarlet; the same color extends up on the side of the head at the base of the bill to very near the nostril. The scarlet color is confined to the terminal portion of the feather; the basal half is grayish-brown, slightly tinged with green—under the wings the green color predominates on the basal half. The lower portion of the tibia violet; the lengthened feathers of the crest green on the forehead and purple on the top and back of the head; the back and upper wing-coverts green; rump and upper tail-coverts greenish-yellow; the colors of the rump, abdomen, and tibia mingle on the long feathers of the thigh; a short line of yellow sprinkled with red at the bend of the wing; the short under wing-feathers green; the rest of the under surface of the wing grayish-brown, glossy in appearance; a narrow line of light blue on the outer margin of the wing; the edge of the outer web of two or three of the longest primaries margined with the same color; the margins of the other primaries green; the rest of the outer web, the shaft, and the inner web of the primaries and secondaries, as well as the apices of the primaries, brownish-black; the under tail-coverts scarlet and yellow, a mixture of the colors of the rump and abdomen; the outer web of the tail-feathers violet; the inner scarlet, tips green. Lower mandible yellow; upper light brown; tarsus and feet light brown.

Total length about 8.00 inches; bill from feathers on the side of the head 0.50; wing 5.20; tail 3.20; tarsus 0.60; middle toe 0.65; claw 0.30.

The following concerning this bird is taken from Finsch's "Die Papageien":—"This is one of the rarest parrots existing. It is to be found only in a few museums. It was erroneously said by Wagler to come from the Sandwich Islands. Latterly, this rare species does not seem to come to Europe at all, which is surprising, inasmuch as the Society Islands, which thus far have been regarded as their only home, have considerable traffic with Europe. As a special locality, Vigors mentions the island of Tuhutitiruha [*sic*] near Tahiti; Lesson gives Borabora. Bourjot's specimen in the Paris Museum is said to have come from Fanning Island, northwest of Christmas, and northeast of the Phœnix group. But, although everything is diametrically opposed to this statement, it may, nevertheless, not be improbable that this very island is its true home."

From the foregoing statement, it is evident that much uncertainty existed in regard to the habitat of *C. kuhli*, with the weight of the testimony inclining toward the Society Islands. It is our pleasure to have dispelled the doubt, and to have assigned the bird to its only true homes,—Washington and Fanning islands of the Fanning group. It is quite natural that such an opinion should prevail, and it is thus that we would account for it. Natives of the southern groups visit these islands periodically, to make cocoanut-oil. We found a party of them on Washington Island at the time of our visit, and in the possession of the men were a number of the lories that had been caught and tamed. It is evident that when these men return to their homes, they carry the birds along with them, and in this way they have probably fallen into the hands of collectors, who have them sent to Europe as coming from the Society Islands.

Fanning Island is situated about seventy miles to the south of Washington Island. It possesses a good anchorage, and has been visited a number of times by exploring expeditions; and, it is probable that Bourjot's specimen reached Europe through one of these. The island was discovered by Capt. Edmund Fanning, an American sailor, in 1798, and it is evident from the following untechnical description, copied from his "Voyages", that the lory was found living there at the time of his visits:—"Amongst the birds was one species about the size of our robin [*Turdus migratorius*]; with a breast-of scarlet-colored feathers, the under portion of the body being finished off with bright red, the neck of a golden color, back a lively green, with a yellow beak, except the very points, which were of a light dun color, the wings and tail being both of a jet black, and the last tipped off with white; it was a most beautiful and lovely bird, with its brilliant and richly variegated plumage. We were much chagrined, while observing these, to see a man-of-war hawk flying by with one in his mouth, apparently having just caught it." If we are allowed to state our own opinion in regard to the last sentence of this quotation, we would suggest that it was the red throat of the man-of-war hawk, and not a parrot, which our narrator saw.

When the islander wishes to take the lories alive, he provides himself with two pieces of bamboo, each about a yard long. On the end of one he perches a tame bird, and from the extremity of the other suspends a short running noose made of cocoanut-fibers. The decoy bird as it is carried about among the cocoanut-trees utters a harsh, rasping sound, and wild birds fly down from the trees and alight alongside it on the bamboo stick, when by means of the other stick they are skillfully noosed.

When caged aboard the ship, they exhibited as pretty a picture of love as one can imagine, well meriting their name of "*love-birds*". They sat billing and smoothing each other's feathers for hours, and as night came on two would get together and sleep with heads turned toward each other. They lived in confinement but a very short time and bore it badly. At times, even while we stood watching their lively antics, one would tumble off its perch and die, apparently in convulsions.

The islands on which these birds are found are very small, and it would not require a very great effort to totally exterminate them.

STRIGIDÆ.

OTUS BRACHYOTUS, (*Gm.*) *Boie* [No. 67365].

Strix brachyotus, GM., Syst. Nat., i, 1788, 289.

Otus brachyotus, BOIE, Isis, 549.

Brachyotus palustris, GOULD, B. Eur., pl. 40.—COUES, Key N. A. Birds, 1872, 204; Birds Northwest, 1874, 306.

Brachyotus cassini, BREW., Proc. Boston Soc., 1856.—BD., Birds N. Am., 1858, 54.

Otus (*Brachyotus*) *brachyotus*, BD., BREW., & RIDG., N. A. Birds, iii, 1874, 22.

Locality: Talcahnano, Chili. One specimen.

FALCONIDÆ.

PANDION HALIÆTUS, (*Linn.*) *Cuv.* [No. 70648].

Falco haliætus, LINN., Syst. Nat., i, 1766, 129.

Pandion haliætus, CUV., Règne Anim., i, 316.—COUES, Key N. A. Birds, 1872, 219; Birds Northwest, 1874, 367.

Pandion carolinensis, BP., List, 3.

Pandion haliætus var. *carolinensis*, RIDG., Proc. Acad. Nat. Sci. Phila., 1870, 143.—BD., BREW., & RIDG., N. A. Birds, iii, 184.

Pandion leucocephalus, GOULD, Syn. B. Aust., i, 22; Birds Aust., pl. 6.

Pandion haliætus var. *leucocephala*, RIDG.—BD., BREW. & RIDG., N. A. Birds, iii, 183.

Locality: San Geronimo Island, Pacific coast of Lower California. One specimen. We observed a number of old nests on this island, built, in the absence of trees, upon high points of rock. At a place on the gulf coast of the peninsula, an osprey was observed breeding in February, and we procured some of its eggs.

CHARADNIDÆ.

SQUATAROLA HELVETICA, (*Linn.*) *Brehm* [No. 70649].

Tringa helvetica, LINN., Syst. Nat., i, 1766, 250.

Squatarola helvetica, BREHM, V. D., 554.—BD., Birds N. Am., 697.—COUES, Key N. A. Birds, 243; Birds Northwest, 448.

Vanellus helveticus, VIEILL., Ency. Méth., iii, 1077.

Charadrius helveticus, LICHT., Verzeich., No. 728.—AUD., Orn. Biog., iv, 280, pl. 334.

Charadrius (*Squatarola*) *helvetica*, RIDG., Ann. Lyc. N. Y., x, 1874, 383.

Tringa varia, LINN., Syst. Nat., i, 1766, 252.

Charadrius varius, FINSCH & HARTL., Vög. Ost-Afr., 1871, 644.

Pluvialis varius, SCHL., Mus. P.-B., *Cursores*, 1865, 53.

Tringa squatarola, LINN., Syst. Nat., i, 1766, 252.

Pluvialis squatarola, MACGIL., Man. N. H. Orn., ii, 48.

The complete synonymy of the species may be found in Coues's Birds of the Northwest.

Locality: San Geronimo Island. One specimen.

CHARADRIUS FULVUS, *Gm.* [Nos. 67338, 67339].

Charadrius fulvus, GM., Syst. Nat., i, 1788, 687.—COUES, Birds N. W., 1874, 449.

Pluvialis fulvus, BP., C. R., 417.

Charadrius pluvialis, HORSF., Linn. Tr., xiii, 1822, 187.

Charadrius xanthocheilus, WAGL., S. A., 1827.

Pluvialis xanthocheilus, BP., C. R., 417.

Charadrius taitensis, LESS., Man., ii, 321.

Pluvialis taitensis, Bp., C. R., 417.
Charadrius virginianus, Jard. & Selt., Ill., ii, pl. 85.
Charadrius glaucopus, Forst., Descr. An., ed. Licht., 1844, 176.
Charadrius longipes, "Temm. Mus. Lugdun."
Pluvialis longipes, Bp., C. R., 417.
Charadrius auratus orientalis, Temm. Schl., Faun. Japon., pl. 62.
Charadrius auratus, Schrenck, Reise Amur, 1860, 410.

Locality: Oahu, Hawaiian Islands. Two specimens. In regard to the habits of these birds, we were informed by residents of the island that they make their first annual appearance about September. When they arrive, they are very poor and weak, having evidently been on a lengthy voyage and been deprived of food for a long time. During their stay through the winter, they become very fat. About March or April, they begin to prepare for their departure. They can be seen during the day, at this time, taking long or short flights out at sea and returning again to the island. This exercise is undoubtedly for the purpose of strengthening themselves for the final effort—their muscles during their winter's life of luxury and ease having become flabby and feeble. We have met them at sea, a long distance from any land, very much exhausted, and have known them to take refuge aboard the ship, where, if not molested, they would remain until we neared land.

HÆMATOPODIDÆ.

HÆMATOPUS NIGER, *Pallas* [No. 70650].

Hæmatopus niger, Pallas, Zoog. Rosso-Asiat., ii, 1811, 131.—Coues, Key N. A. Birds, 1872, 246.
Hæmatopus bachmani, Aud., Orn. Biog., v, 1839, 245, pl. 427.

Locality: Saint Martin's Island, Pacific coast of Lower California. One specimen.

STREPSILAS INTERPRES MELANOCEPHALUS, (*Vig.*) *Coues* [No. 70651].

Strepsilas melanocephalus, Vig., Z. J., iv, 1829, 356.—Cass., Baird's N. Am. Birds, 1858, 702.
Strepsilas interpres var. *melanocephalus*, Coues, Key N. A. Birds, 1872, 246; Birds Northwest, 1874, 459.

Locality: San Geronimo Island. One specimen. A characteristic example of this peculiar form, entirely dusky and white, without a trace of rufous coloration. The feet also are dark-colored, being apparently blackish-olive.

SCOLOPACIDÆ.

TRINGA MINUTILLA, *Vieill.* [Nos. 70652, 70653, 70654, 70655.]

Tringa minutilla, VIEILL., Nouv. Dict. d'Hist. Nat., xxxiv, 1819, 452.—COUES, Key N. A. Birds, 1872, 254; Birds Northwest, 1874, 482.

Actodromus minutilla, BP., Comp. Rendus, 1856.

Actodromas minutilla, COUES, Proc. Acad. Nat. Sci. Phila., 1861, 191, 230.

Tringa pusilla, WILS., Am. Orn., v, 1813, 32, pl 37, f. 4 (not of European writers).

Pelidna pusilla, BP., List, 1838, 50.

Tringa wilsoni, NUTT., Man., ii, 1834, 121.—BD., Birds N. Am., 1858, 721.

Actodromus wilsoni, BP., Comp. Rendus, 1856.

Locality: San Geronimo Island. Several specimens.

CALIDRIS ARENARIA, (*Linn.*) *Illiger* [Nos. 70656, 70657, 70658].

Tringa arenaria, LINN., Syst. Nat., i, 1766, 251.

Calidris arenaria, ILL., Prod., 1811, 249.—BD., Birds N. Am., 1858, 723.—COUES, Key N. A. Birds, 1872, 257, f. 167; Birds Northwest, 1874, 492.

Charadrius calidris, LINN., Syst. Nat., i, 1766, 255.

Arenaria calidris, MEYER, Tasch. Deutschl. Vög., 68, pl. 59, f. 4.

Charadrius rubidus, GM., Syst. Nat., i, 1788, 688.

Arenaria vulgaris, BECHST., Tasch. Deutschl., ii, 462.

Arenaria grisea, BECHST., Naturg. Deutschl., iv, 368.

Calidris grisea, BREHM, Vög. Deutschl., 674.

Trynga tridactyla, PALL., Zoog. R.-A., ii, 1811, 198.

Calidris tringoides, VIEILL., Gal. Ois., ii, 1834, 95, pl. 234.

Calidris americana, BREHM, Vög. Deutschl., 1831, 695.

Calidris nigellus, VIEILL. (vide Gray's Hand-List, No. 10324).

Localities: San Geronimo Island and La Libertad, Sonora, Mexico. Several specimens.

TOTANUS SEMIPALMATUS, (*Gm.*) *Temm.* [No. 70659].

Scolopax semipalmata, GM., Syst. Nat., i, 1788, 659.

Totanus semipalmatus, TEMM., Man. Orn., ii, 637.—COUES, Key N. A. Birds, 1872, 258; Birds Northwest, 1874, 494.

Totanus (*Catoptrophorus*) *semipalmatus*, BP., Syn., 1828, 328.

Catoptrophorus semipalmatus, BP., List, 1838, 31.

Glottis semipalmata, NILSSON, Fn. Suec., 1817.

Hodites semipalmata, KAUP, Sk. Ent. Eur., 1829.

Symphemia semipalmata, HARTL., Rev. Zool., 1845, 342.—BD., Birds N. Am., 1858, 729.

Totanus crassirostris, VIEILL., Nouv. Dict. d'Hist. Nat., 1816, 406.

Symphemia atlantica, RAFINESQUE, Jour. Phys., lxxxviii, 1819, 417.

Locality: San Geronimo. One specimen. Various species of waders were particularly abundant on this island.

HETEROSCELUS INCANUS, (*Gm.*) *Coues* [No. 67321].

Scolopax incana, GMEL., Syst. Nat., i, 1788, 658,
Tringa glareola, PALLAS, Zoog. Ross.-As., ii, 1811, 194, pl. 60.
Totanus brevipes, VIEILL., Nouv. Dict. d'Hist. Nat., vi, 1816, 410.
Scolopax undulata, FORST., Descr. An., ed. Licht, 1844, 173.
Scolopax pacifica, FORST., Descr. An., ed. Licht., 1844, 174.
Totanus oceanicus, LESS., Consp. Buff., 1847, 244.
Totanus polynesiæ, PEALE, U. S. Expl. Exped., Orn., 1848, 237.
Totanus fuliginosus, GOULD, Voy. Beagle, Birds, 1841, 130.
Heteroscelus brevipes, BD., Birds N. Am., 1858, 734, pl. 88.
Heteroscelus incanus, COUES, Key N. A. Birds, 1872, 261.

Locality: Palmyra Island, Fanning group, North Pacific Ocean.

NUMENIUS FEMORALIS, *Peale* [No. 67336].

Numenius femoralis, PEALE, U. S. Expl. Exped., Orn. 1848, 233, pl. 37.—COUES, Check-list N. A. Birds, 1874, 135.

Locality: Palmyra Island. Very abundant on this island. A few only were seen on Christmas and the other islands of the group.

RALLIDÆ.

GALLINULA SANDVICENSIS, *Streets* [No. 67361].

"*Gallinula chloropus* AUD."(=*G. galeata*), PEALE, U. S. Expl. Exped., Orn., 1848, 220 (nec auct.).
Gallinula sandvicensis, STREETS, Ibis, i, 4th series, 1877, p. 25, fig.

Frontal plate very large, terminating squarely on the top of the head, much inflated, the posterior margin on a line with the posterior border of the orbit; latterly, it encroaches on the orbit, being separated from it by a very narrow feathered space; the bill shorter than the head, thick, compressed; wings rather short in proportion to the size of the species, when compared with other species of the same group; first primary shorter than the second; second and third of equal lengths, the rest graduated; tail short; tarsus rather long and stout, rounded in front, and compressed posteriorly; toes and claws long and robust.

The entire under surface of the body of one color, which is a dark slaty; no marks of white on the abdomen; the head and neck all around much darker than the rest of the body—nearly black, with a slight brownish tinge; a few of the long feathers of the flanks with long spots of white on the superior web; the edge of the wing at the bend, and the external margin of the outer web of the first primary marked with a very constricted line of white; the under surface of the wing of the same color as the under parts of the body; the longer under tail-coverts pure white, the rest black; the entire upper parts, including the upper surfaces of the wings and tail, olive-brown; this color deepest on the rump, and fading out on the neck and the exterior portions of the wings; the tips of the tail-feathers, and the shafts of the feathers brownish-black.

The frontal plate and bill bright crimson, the latter tipped with yellow; the tibia naked for about an inch, and surrounded by a bright crimson ring; a decided crimson blush on the front of the tarsus, the color deepens on the sides; feet pea-green.

Total length about 13.50 inches; wing 6.50; tail 3.00; bill along the commissure 1.20; from the feathers on the side of the head 1.00; along the culmen, including the frontal plate, 1.65; breadth of the frontal plate 0.50; length, from the margin of the feathers on the side of the bill, 0.70; tarsus 2.00; middle toe and claw 3.00.

To sum up;—the proportions of *Gallinula sandvicensis*, and the quadrate form of the frontal plate show that its strongest affinities are with *Gallinula galeata*, rather than with any other member of the group; but the greater extent of the frontal plate, the shorter wing, the absence of white on the abdomen and on the under surface of the wing, as well as its reduction to a mere trace on the margin of the latter, the more robust and different form of the tarsus, being broader and more rounded in front, as well as the great difference in the color of the tarsus, are characters which separate it immediately from *G. galeata*, and render its identification easy. The characters just enumerated, in addition to its larger size and the quadrate frontal plate, separate it *a fortiori* from the *G. chloropus*.

Locality: Oahu, Hawaiian Islands. The only direct reference to this bird which I have been able to find is made by Peale in the Ornithology of the United States Exploring Expedition, page 220. He undoubtedly obtained a specimen from the island of Oahu, but the skin, he states, was lost. In the description which he gives from his field-notes, he calls the bird *Gallinula chloropus* Aud., *i. e. G. galeata.* The allusion which he makes, however, to the crimson-colored tarsi identifies his bird at once with our species. Gray, in his Hand-List of Birds, gives the Sandwich Islands as a habitat of *G. chloropus* Aud., as do also Hartlaub and Finsch, in the table of distribution of Central Polynesian birds, in the introduction to their work, "Die Ornithologie der Viti-, Samoa-, und Tonga-Inseln." It is highly probable that both of these authorities based their statements upon Peale's original reference.

FULICA ALAI, *Peale* [No. 67360].

Fulica alai, PEALE, U. S. Expl. Exped., 1848, Orn., 224, pl. lxiii, f. 2.

Locality: Oahu, Hawaiian Islands.

ANATIDÆ.

CHAULELASMUS COUESI, *Streets* [Nos. 67324, 67325].

Chaulelasmus couesi, STREETS, Bulletin of the Nuttall Ornithological Club, vol. i, No. 2, 46.

Bill nearly as long as the head, about as deep as broad at the base, depressed anteriorly, sides nearly parallel, converging slightly toward the base; tip rounded, and unguis abruptly curved; frontal angle short and obtuse; dorsal line at first sloping—rather more so than in *C. streperus*—anterior portion broad, straight, and flattened. Internal lamellæ numerous, small and closely packed, about seventy-five in number—in *streperus* only about fifty. Nostrils sub-basal, lateral, large, oblong.

Plumage (*immature*).—Head above dark brown, the apical portion of the feathers of a lighter shade than the basal, those on the frontal region with the central portion black, and the edges brownish-white; throat and sides of head brownish-white, a small brown spot at the extremity of each feather, shafts brown, on the lower portion of the neck, and on breast all around the feathers are marked with concentric bars of black and light reddish-brown; under surface of the body white, with a broad dark band across the extremity of each feather, giving to this region a mottled appearance; toward the tail, the white of the abdomen assumes a dull reddish-brown tinge; a decided brownish-red color on the flanks, and on the sides of the body covered by the wings. On the back, the plumage is more mature. Color dark brown, marked transversely with fine wavy lines of black and white; scapulars dark brown, fringed with a narrow rim of reddish-brown; middle wing-coverts chestnut; the greater a velvety-black; speculum pure white, the inner webs of the white feathers being grayish-brown; on the third feather of the speculum, counting from within, the white gives place to a hoary-gray, with a black outer margin; the primaries light brown, with the portions of both webs nearest the shaft somewhat lighter. Tail containing fourteen feathers; color hoary plumbeous-gray, under surface lighter and shining; under tail-coverts crossed by transverse bars of black and white; upper coverts composed of dark brown and black feathers intermingled. Under wing-coverts and axillars pure white. Bill and feet black; the inner side of the tarsus is perceptibly lighter than the feet. Tibia bare for about half an inch.

Length 17 inches; wing 8; tarsus 1.40; commissure 1.65; culmen 1.45; height and breadth of bill at base 0.55; average width of bill 0.55. First toe 0.30; second 1.48, including claw shorter than the third toe without claw; third toe 1.88 without claw, longer than the outer toe without claw; outer toe 1.75.

A female is similar, but with little trace of the peculiar wing-markings, both chestnut and black being wanting, and the speculum being hoary-gray instead of white. Both the specimens before me are immature; the adults, it is presumed, will show the peculiar vermiculated appearance of *C. streperus*. They resemble the immature condition of *C. streperus* so closely that one description of the coloration would answer for both species; but the *C. couesi* is immediately distinguished by its greatly inferior size, which hardly exceeds that of a teal, the different color of the bill and feet, and the singular discrepancy in the lamellæ of the bill, which are much smaller, and one-third more numerous.

Locality: Washington or New York Island, Fanning group.

The discovery of this duck is highly interesting from the fact that it is the second known representative of a genus that is almost world-wide in its distribution. The present species is as restricted in its habitat as the other is wide spread—being confined to the limited area of a coral island in the mid-Pacific.

I dedicate this species to one of our most distinguished ornithologists, Dr. Elliott Coues, U. S. A., as a slight testimonial of regard, and in consideration of the service which he has rendered to the science of ornithology.

SULIDÆ.

SULA LEUCOGASTRA, (*Bodd.*) *Salv.* [No. 70660].

Petit Fou, BUFF., Pl. Enl., 973.
Pelecanus leucogaster, BODD., Tabl. Pl. Enl., 57.
Dysporus leucogaster, SUNDEV., Proc. Zoöl. Soc. London, 1871, 125.
" *Sula fiber*, LINN.", SCL. & SALV., Nomencl., 124.
Sula leucogostra, SALV., Trans. Zoöl. Soc. London, ix, 1876, 496.
Sula fusca, AUD., Birds Am., vii, 1844, 57, pl. 426.
Sula fiber, COUES, Key N. A. Birds, 1872, 298.

This is the *Sula fusca* of earlier American ornithologists, and the *Sula fiber* of the more recent writers; but, according to late authorities, the name *fiber* should be used as a synonym of *Sula piscator*, having been given by Linnæus to the young of that species.

Locality: Tiburon Island, Gulf of California. This is an abundant species in the gulf. It was breeding in April. The nest from which our specimen was taken contained two eggs, differing remarkably in size: one measuring 2.35 by 1.70; the other only 2.20 by 1.50. They are of the usual elliptical shape, greenish-white, with the ordinary, thick, white, calcareous incrustation.

SULA PISCATOR, (*Lynn.*) *Bp.* [Nos. 67319, 67327, 67332].

Pelecanus piscator, LINN., Syst. Nat., i, 1766, 217.
Sula candida, BRISS., Steph. Gen. Zoöl., xiii, 1826, 103.
Sula erythrorhyncha, LESS., Traité, i, 1831, 601.
Sula rubripes, GOULD, Proc. Zoöl. Soc. London, 1837, 156.
Sula rubripeda, PEALE, U. S. Expl. Exped., Orn., 1848, 274.
Sula piscator, BP., Consp. Av., ii, 1857, 166.

Locality: Fanning group, North Pacific. Several specimens were taken at sea in the vicinity of this group of islands. When far away from land, they flew aboard the ship in the evenings, and roosted on the yards. They exhibited no signs of fear, but were easily captured by the men who went aloft. In the majority of our specimens, the tail is dark—it is white in the adult plumage. On Palmyra Island, their principal breeding-place, the period of their incubation was over at the time of our visit in December, but the young were not yet fledged. The latter were very numerous; they covered the trees and bushes, and looked like great balls of snow-white down. The nests are rudely constructed of coarse twigs, and are built on the low trees.

We arrived at Christmas Island one month later, in January, and there we found the gannets still sitting on their eggs; few or no young were to be seen. This difference is probably induced by the physical conditions surrounding them. One of the islands is situated almost directly on the equator, exposed to the fiercest rays of a tropical sun; it is devoid of fresh water, and it rarely or never rains; the vegetation is scanty and stunted, and life in general has a very unequal struggle for existence. On the other island, Palmyra, a condition of things directly opposite to these exists. The gannets of Christmas Island have a very curious habit, which, as far as our observations extended, is confined to those of that island. Under their nests, which were quite low on account of the stunted condition of the shrubbery, were mounds one and two feet high, built of twigs, and in some instances solidly cemented together by their excrement. It probably affords them diversion during the monotonous period of incubation to break off all the twigs within reach of their bill, and to drop them under their nests. These mounds furnish evidence of the nests being occupied for several successive years; for the lean bushes could not furnish a sufficient amount of twigs to build them up in a single breeding-season.

One is the usual number of eggs, though sometimes two were found in the same nest. They are somewhat larger, but in every other respect similar to the eggs of *Sula leucogastra.*

SULA CYANOPS, *Sundev.* [Nos. 67315, 67316].

Dysporus cyanops, SUNDEV., Phys. Tidskr. Lund., 1837, pt. 5.
Sula cyanops, SUNDEV., Isis, 1842, 858.
Sula personata, GOULD, Proc. Zoöl. Soc. London, 1843, 21.
Sula piscator, PEALE, U. S. Expl. Exped., Orn., 1848, 273.

Locality: Christmas Island. One specimen in immature plumage. The whole of the upper surface of the body dark brown, mottled with white. The brown color of the back and upper surface of the wings has a grayish tinge; the head and neck all around dark brown, as in *S. leucogastra*, except that the dark color does not extend as far down on the breast as in the latter. The general system of coloration is much the same as in *leucogastra.* If we are to learn anything from the transitional plumages of birds, may it not be that they show us the parent types from which the species are progressively developed? Many instances might be mentioned where the immature plumages of birds represent the perfect plumage of some closely allied species.

S. cyanops were breeding on Christmas Island. They were not very abundant. They build no nest, but scratch a slight concavity in the fine coral sand, where the egg is deposited. All of those observed breeding on Christmas Island were in full adult plumage. One, a young bird in the *leucogastra* style of dress, was seen nesting on Palmyra. Its nest was on the ground, and was well constructed of grass. This is another exemplification of the rule observed all along of the different habits of the same species of birds on these two islands.

GRACULIDÆ.

GRACULUS BRASILIANUS, (*Gm.*) *Gray* [No. 67369].

Procellaria brasiliana, GM., Syst. Nat., i, 1788, 564.
Puffinus brasiliensis, BR., AV., vi, 1760, 138, sp. 4.

Pelecanus vigna, VIEILL., Enclyclop. Méthod., i, 1823, 342.
Haliæus brasilianus, LICHT., Doubl. d. Zool. Mus., 1823, 86, 908.
Graculus brasilianus, GRAY, Gen. of Birds, t. — .
Phalacrocorax graculus, GOULD, B. of Eur., t. 408.
Phalacrocorax niger, KING, Zoöl. Jour., iv, 1828, 101, sp. 63.
Carbo mystacalis, LESS., Traité d'Orn., 1831, 604.
Carbo brasilianus, SPIX, Av. Brasil, ii, 1824, t. 106.
Zaramagullon negro, AZARA, Apunt. Hist. Nat. Paxaros del Paraguay, &c., iii, —, 395, 423.

Locality: Concepcion Bay, Chili.

TACHYPETIDÆ.

TACHYPETES MINOR, (*Gm.*) *Illig.* [No. 67320].

Pelecanus minor, GM., Syst. Nat., i, 1788, 572.
Pelecanus palmerstoni, GM., Syst. Nat., i, 1788, 573.
Fregata minor, BR., Av., vi, 1760, 509, sp. 7.
Tachypetes minor, ILLIG., Prodro., 1811.
Attagen ariel, GOULD, Birds of Austr., vii, t. 72.
Tachypetes ariel, GRAY, Gen. Birds, t. 185.

Localities: Christmas and Palmyra Islands. One of the specimens a young bird with a white head. Not very abundant. They were not breeding on any of the islands at the time of our visit.

PHÆTHONTIDÆ.

PHÆTHON RUBRICAUDUS, *Bodd.* [Nos. 67329, 67330].

Phæthon rubricauda, BODD., Tabl. Pl. Enl. d'Aub., 1783, 57.—BUFF., Pl. Enl., 979.
Phæthon phœnicuros, GM., Syst. Nat., i, 1788, 583.
Phæthon æthereus, BLOXH., Voy. Blonde, 1826, 251.
Phœnicurus rubricauda, BP., Consp. Av., ii, 1857, 183.

Locality: Christmas Island. Two specimens. One in immature plumage. The feathers of the whole upper surface of the head, neck, and body marked with transverse bars of black and white. Bill black. The elongated central tail-feathers absent. These birds were brought to the ship by the sailors from a distant part of the island. They were taken from off their nests, which were on the ground under low bushes. Egg white, speckled with brown.

LARIDÆ.

LARUS ARGENTATUS OCCIDENTALIS, (*Aud.*) *Cs.* [No. 70664].

Larus occidentalis, AUD., Orn. Biog., v, 1839, 320.
Glaucus occidentalis, BRUCH., J. f. O., 1853, 101.

Laroides occidentalis, Bruch., J. f. O., 1855, 282.

Larus argentatus var. *occidentalis*, Coues, Key N. A. Birds, 1872, 312; Birds Northwest, 1874, 626.

Locality: Lower California. In perfect breeding-plumage, well illustrating this form in the strength of the bill, slaty-grayish shade of the mantle, &c.

LARUS (BLASIPUS) HEERMANNI, *Cass.* [Nos. 70665, 70666, 70667].

Larus heermanni, Cass., Proc. Acad. Nat. Sci. Phila., vi, 1852, 187; Illus., 1853, 28, pl. 5.

Larus (*Blasipus*) *heermanni*, Scl. & Salv., Proc. Zoöl. Soc. London, 1871, 574.—Coues, Birds Northwest, 1874, 641.

Blasipus heermanni, Bp., Consp. Av., ii, 1856, 211.

Adelarus heermanni, Bruch., J. f. O., 1853, 107; 1855, 279.

Larus belcheri, Schl., Mus. P.-B., Lari, 9 (in part).

Larus (*Balsipus*) *belcheri*, Coues, Key N. A. Birds, 1872, 314 (in part).

Locality: Isla Raza, Gulf of California. Isla Raza is the particular breeding-place of these gulls in the gulf. It is a small, low island, about three-quarters of a mile long and half a mile wide. At the time of our visit (April), immense numbers of the birds were congregated there, preparatory to laying their eggs, which, however, they had not begun to deposit. We may safely say, without exaggeration, that there was a bird on every square foot of the ground, and others were continually hovering about overhead. Their incessant noise deadened all other sounds, and so intent were they in their all-absorbing duties of reproduction, that they seemed entirely unconscious of our presence amongst them. The formation of the island is a black volcanic rock, entirely destitute of vegetation. Through the long series of years during which these birds have made it a breeding-place, there has been going on a chemical reaction between the acids of their excrement and the bases of the rock, which has resulted in the formation of a new substance, composed largely of a tri-basic phosphate. This now forms (or did form) a thick layer, covering the whole surface of the island. On breaking open the bowlders, a sharp line of demarkation can be seen extending into the body of the rock showing the depth of the chemical reaction. The altered rock being a softer material than the original is easily pulverized and worn off by the constant attrition of the birds' feet during their breeding-season. In this way, the inequalities of the surface of the rocky islet have been smoothed over. A company has possession of the island, and is gathering the guano. Ten thousand tons have been removed, and it is calculated that six times that quantity still remains to be gathered (1875).

In perfect breeding-dress. The eyelids are red, like the bill.

HYDROCHELIDON LARIFORMIS, (*Linn.*) *Coues* [Nos. 70661, 70662].

Rallus lariformis, LINN., Syst. Nat., i, ed. 10, 1758, 153.
Sterna fissipes, LINN., Syst. Nat., i, 1766, 228.
Hydrochelidon fissipes, GRAY, Gen. of Birds, iii, 1849, 660.—COUES, Key, 1872, 323.
Sterna nigra, BRISS., Av., vi, 1760, 211, pl. 20. f. 1.
Hydrochelidon nigra, BOIE, Isis, 1822, 563.
Hydrochelidon nigrum, BP., List, 1838, 61.
Viralva nigra, LEACH, Gen. Zoöl., xiii, 1826, 167.
Sterna nævia, LINN., Syst. Nat., i, 1766, 228.
Sterna surinamensis, GM., Syst. Nat., i, 1788, 604.
Hydrochelidon surinamensis, BP., Comptes Rendus, 1856, 772.
Hydrochelidon (Pelodes) surinamensis, GRAY, Hand-List, iii, 1871, 122, No. 11074.
Hydrochelidon nigricans et *obscura*, BREHM, V. D., 1831, 794, 795.
Sterna plumbea, WILS., Am. Orn., vii, 1813, 83, pl. 60.
Hydrochelidon plumbea, LAWR., B. N. A., 1858, 864.
Hydrochelidon lariformis, COUES, Birds Northwest, 1874, 704.

Locality: Mita Point, Sinaloa, Mexico. Taken in May, at which period one had completed its breeding-dress, while the other had only begun to change its winter plumage.

STERNA (HALIPLANA) FULIGINOSA, *Gm.* [Nos. 67322, 67328, 67334].

Sterna fuliginosa, GM., Syst. Nat., i, 1788, 605.
Sterna (Onychoprion) fuliginosa, GRAY, List Br. B., 1863, 242.
Sterna (Haliplanes) fuliginosa, BLAS., List B. Eur., 22.
Sterna (Haliplana) fuliginosa, COUES, Key N. A. Birds, 1872, 322; Birds Northwest, 1874, 698.
Onychoprion fuliginosa, WAGL., Isis, 1832, 277.
Haliplana fuliginosa, WAGL., Isis, 1832, 1224.
Hydrochelidon fuliginosum, BP., List, 1838, 61.
Sterna serrata, FORST., Descr. An., ed. Licht, 1844, 276.
Onychoprion serrata, WAGL., Isis, 1832, 277.
Haliplana serrata, BP., Comptes Rendus, 1856, 772.
Sterna guttata, FORST., Descr. An., ed. Licht., 1844, 211.
Anous l'herminieri, LESS., Descr. Mammif. et Ois. 1847, 255.
Sterna luctuosa, PHIL. & LANDB., Wieg. Arch., 1866, 126.
Sterna fuliginosa var. *crissalis*, BD., apud LAWR., Proc. Boston Soc., 1871.

Locality: Palmyra Island, Fanning group. They were particularly abundant on this island only. We arrived amongst them at the commencement of their breeding-season. The spot which they had chosen for breeding purposes was the extreme eastern or windward point of the island, within a stone's throw of the breakers. They breed in communities; and so numerous were they on this occasion that they formed a cloud when they arose from the ground, and their clamor deadened the roar of the surf. They make no attempt at building a nest, but deposit their one egg anywhere on the bare ground. The eggs were almost as thick as the clinkers on the coral beach.

ANOUS STOLIDUS, (*Linn.*) *Gray* [Nos. 67323, 67326].

Sterna stolida, LINN., Syst. Nat., i, 1766, 227.
Megalopterus stolidus, BP., List, 1838, 61.
Anous stolidus, GRAY, List Gen. of Birds, iii, 1841, 100.—COUES, Key N. A. Birds, 1872, 323; Birds Northwest, 1874, 710.
Anous niger, STEPH., Gen. Zoöl., xiii, 1826, 140.
Gavia leucoceps, SW., Classif. B., ii, 1837, 373.

Localities: Palmyra and Christmas Islands. Breeding in both localities. There was a marked difference in the habits of the birds of the two islands. On Palmyra, they build nests of twigs in the forks of the tallest trees; a few were observed to build nests in the cocoanut-trees at the bases of the leaves. On Christmas Island, where there are no trees, they lay their eggs on the bare ground within a circle of a few twigs.

GIGIS ALBA, (*Sparrm.*) *Bp.* [No. 67335].

Sterna alba, SPARRM., Mus. Carls., No. xi, 1786.
Sterna candida, GM., Syst. Nat., i, 1788, 607.
Gigis candida, WAGL., Isis, 1832, 1223.
Gigis alba, BP., Compt. Rend., 1856, 773.
Gigis nepoleonis, BP., Compt. Rend., 1856, 773.

Localities: Palmyra and Christmas Islands. These furnish us with another interesting example of the power of birds to conform to their surroundings in their breeding habits. They lay but one egg, which is very large for the size of the bird, and it was in every instance, on Palmyra Island, placed on the naked branch of a tree. In some cases, the diameter of the limb on which it rested barely exceeded that of the egg itself; yet there it remains during the whole period of incubation, and the narrow lodge is the resting-place of the young bird until it is able to fly. On Christmas Island, the same obstacle is in the way of the gratification of their desires as was mentioned in the case of the noddy terns, namely, the absence of trees, but the surfaces of the large coral blocks are made to serve their purposes equally as well. The *Gigis alba* exhibited a greater degree of curiosity than any of the other birds of the islands. They were continually hovering about over our heads when we were ashore, and, indeed, often seemed inclined to alight upon the theodolite while the officers were triangulating about the island.

PROCELLARIIDÆ.

ADAMASTOR CINEREUS, (*Gm.*) *Coues* [Nos. 67370, 67371].

Procellaria cinerea, GM., Syst. Nat., i, 1788, 563.
Puffinus cinereus, (GM.) LAWR., Birds N. A., 1858, 835.
Procellaria hæsitata, FORST., Descr. An., ed. Licht., 1844, 208.
Puffinus hæsitatus, LAWR., Ann. Lyc. Nat. Hist. N. Y., 1853, vi, 5.
Adamastor typus, BP., Consp. Av., ii, 1856, 187.
Procellaria adamastor, SCHLEGEL, Monog. *Proc.* Mus. Pays-Bas, 1863, 25.
Adamastor cinereus, COUES, Proc. Acad. Nat. Sci. Phila., 1864, 119 (critical).

Locality: off Cape Horn.

PUFFINUS (NECTRIS) NATIVITATIS, *Streets*, n. sp. [No. 67318].

Bill shorter than the head, much shorter than the tarsus; size medium; sides compressed, as wide as high at the base; unguis moderate, much hooked; commissure slightly curved from base to unguis, convexity downward; the lower margin of the rami of the inferior mandible straight; unguis concave and slightly deflexed. Nasal tubes about one-fourth of the length of the culmen, broad, depressed, obliquely truncated anteriorly; the nostrils oval; internal septum broad; culmen sloping downward abruptly from the upper part of the nasal tubes, and then rising very gradually toward the unguis. Commissural margins of the upper and lower mandibles inflected. The feathers on the front sweeping across the base of the bill with a gently-rounded outline, gaining the edge of the mandible about three-tenths of an inch from the angle of the mouth; feathers on the side of the lower mandible do not reach quite as far forward as those on the culmen. Wings of moderate length, and all the primaries graduated, the first the longest; tail rounded, containing twelve graduated feathers. Tarsus slender and compressed, equal in length to the middle toe without claw; outer toe without its claw longer than the middle without the appendage, but including claws the middle toe is the longest; the tip of the claw of the inner toe falling short of the base of the middle claw one-tenth of an inch.

The entire coloration of the species sooty-black, without any mixture of gray, except on the chin, where it is very faint; somewhat darker on the head and upper parts, where it is more of a brownish-black; on the under parts, it is of a rich chocolate hue. Bill black; tarsus and feet brownish-black, somewhat lighter on their inner aspects. Primaries and tail-feathers scarcely darker than the rest of the plumage; shafts brown on the upper surface, those of the primaries with a longitudinal line of white on the under surface; the under surface of the shafts of the tail-feathers presents three longitudinal parallel lines of white, one central and two lateral, with broad brownish interspaces.

Total length 14.50 inches; length of bill along the culmen 1.20 inches; along the commissure 1.80; from the feathers on the side of the upper mandible 1.50; from the feathers on the side of the lower mandible 1.35; height of bill at base 0.40; width about the same; length of the nasal tubes 0.30; wings, from the carpus, 9.70; tail 4.20; tarsus 1.70; middle toe and claw 2.00; outer toe and claw 1.90; inner toe and claw 1.65; hallux 0.12.

Locality: Christmas Island. One specimen. Captured on its nest.

The determination of this species is based upon Dr. Elliott Coues's "Critical Review of the Family Procellariidæ". Regarding this monograph as the latest and most exhaustive survey of this very difficult family, we find but one species that could in any way be confounded with the one under consideration, and that is *Nectris fuliginosus* Keys et Blas, a much larger species, and one, moreover, that is confined to the Atlantic Ocean. These two species (*fuliginosus* and *nativitatis*) are the only ones of the subgenus *Nectris* whose plumages are dark fuliginous without any admixture of white.

Kuhl's *Procellaria fuliginosa*, sp. 12, p. 142, is recognized as the *Pterodroma atlantica* Bp. = *Æstrelata fuliginosa* Coues, which is an Atlantic species, and is not a true puffin; the *Procellaria fuliginosa*, sp. 27, p. 148, of the same author, is a *Puffinus*, and is now known as the *pacificus*. Its flesh-colored bill and feet, however, immediately separate it from *nativitatis*. Exactly what is the *Nectris fulginosa*, of Forster, no one seems to know. It is barely possible that it may be the species which we have just described as new; but there is no doubt that the latter is entirely distinct from all the other species which have been described by the old ornithologists under the name *fuliginosa*. If it be the one of which we have implied a doubt (this, however, cannot be proven), a re-description will not be amiss, and a re-naming will be demanded on account of the prior claim of another species to the same name.

ÆSTRELATA PARVIROSTRIS, (*Peale*) *Coues*. [Nos. 67317, 67331].

Procellaria parvirostris, Peale, U. S. Expl. Exped., Orn., 1848, 298.
Rhantistes parvirostris, Bp., Compt. Rend., 1856, 768.
Æstrelata parvirostris, Coues, Proc. Acad. Nat. Sci. Phila., 1866, 146 (critical).

Locality: Christmas Island. Breeding in January. They make their nests on the ground under low bushes. They merely scoop a hole in the ground for the egg. The eggs are large, rotund-elliptical, with a smooth, white, and translucent shell. They are such close setters that nothing could induce them to leave their eggs voluntarily. When we removed them from their nests they instantly returned to their duty on being released.

DIOMEDEA CULMINATA, *Gould* [No. 67368].

Diomedea cholorhynchos, of AUDUBON'S Works.

Diomedea culminata, GOULD, Ann. & Mag. N. H., 1844, xiii, 361.—COUES, Proc. Acad. Nat. Sci. Phila., 1866, 183 (critical).

Locality: at sea, off Cape Horn.

DIOMEDEA NIGRIPES, *Aud.* [Nos. 67362, 67363, 67364, 67365].

Diomedea nigripes, AUD., Orn. Biog., v, 1839, 327.—COUES, Proc. Acad. Nat. Sci. Phila., 1866, 178 (critical).

Diomedea brachyura juv., CASSIN, Illust. B. Cal. & Tex., 1853, 291.

Diomedea gibbosa, GOULD, Ann. & Mag. N. H., 1844, xiii, 361.—COUES, Proc. Acad. Nat. Sci. Phila., 1866, 180.

Locality: North Pacific Ocean. Captured at sea while on the passage between Honolulu and San Francisco. The series is a good one to illustrate the species in nearly all its stages of plumage, and notably that described by Gould as *D. gibbosa*, which is nothing more than the adult plumage of *nigripes*. Dr. Coues, in his excellent "Critical Review of the Family Procellaridæ", alludes to this as the probable conclusion to be arrived at upon a more thorough investigation of the species. We have first presented to us the typical *nigripes*, with its uniformly dusky plumage. The white first makes its appearance on the basal portions of the upper and under tail-coverts; it increases in quantity until there is but a narrow rim of brown left at the apices of the feathers. In older specimens, the brown entirely disappears, and the whole of the crissum and upper coverts are pure white. We then find the white traveling upward and spreading itself over the abdomen. In those specimens that have the greatest amount of white on the under surface of the body, we find a widening area of the same color on the top of the head, spreading backward from the narrow rim that originally surrounded the base of the bill.

ALCIDÆ.

BRACHYRHAMPHUS CRAVERI, (*Salvad.*) *Coues* [No. 70663].

Uria craveri, SALVAD., Descr. Alt. Nuov. Ucc. Mus. di Torino, 1867, 17.
Brachyrhamphus craveri, COUES, Proc. Acad. Nat. Sci. Phila., 1868, 66.

Locality: Isla Raza, Gulf of California. An adult female in full plumage, taken in April, 1875. It was breeding in holes in the rocks, amid the innumerable gathering of *Larus heermanni*, already noticed. Eggs *two*, taken from a crevice of a rock at arm's length. These eggs resemble those of the tern, though rather elliptical-ovoid in shape. They differ from each other decidedly in the ground-color as well as in the markings. The darkest one is brownish-drab, with nearly half of the surface (on the larger end) heavily and confluently blotched with reddish-brown and dark brown, with a few neutral-tint shell-markings interspersed; the rest of the egg is sparsely sprinkled with smaller and more distinct markings of the same color. The ground of the other egg is clay-colored, or very pale stone-gray, with markings of the same colors as before, but less heavy, more distinct, and smaller. There is the same aggregation of spots about the larger end, but not so fully carried out, and the rest of the surface is more thickly and uniformly flecked than the same portion is on the other egg. The darker egg measured 2.05 by 1.40; the other 1.95 by 1.35. The eggs of the species, as far as we are aware, have not before been described.

The specimen of the bird is interesting as coming from far up the gulf, from virtually the same locality as the original of *Uria craveri*, if not from the identical spot, and is Signore Salvadori's bird exactly. As stated by Dr. Coues, in his Monograph (Proc. Acad. Nat. Sci. Phila., 1868, p. 66), it is very closely related to *B. hypoleucus*, the chief difference being, that in the latter the lining of the wings is entirely pure white, while in *craveri* the same part is dusky varied with white. In *craveri*, the line of demarkation between the blackish of the upper and the white of the under parts passes on the side of the head considerably below the eye; while in *hypoleucus* the blackish barely includes the eye, though extending a little farther down on the auriculars. Dr. Coues alludes to the "bare possibility" that *craveri* was the young of *hypoleucus*, a supposition disproved by finding it breeding. *B. craveri* can only be referred to *hypoleucus* now, upon the assumption that the latter is the winter plumage of the former, as all the specimens which have come to hand thus far with the pure white lining of the wings were taken in winter, as far as known. Such an assumption would not be widely at variance with the known characters of the seasonal changes of plumage in some members of this family, but remains to be proven. Pending this determination, *craveri* should be recognized as a good species.

SPHENISCIDÆ.

SPHENISCUS HUMBOLDTI, *Meyen* [No. 67367].

Diomedea chilensis, MOLINA, Hist. Nat. Chili, 1786, 210.
Aptenodytes chilensis, GM., Syst. Nat., i, 1788, 559.
Aptenodytes molinæ, LATH., Ind. Orn., ii, 1790, 881.
Spheniscus humboldti, MEYEN, Nov. Act. Acad. Cæs. Leop. Carol., 1834, xvi, suppl. i, 110, pl. xxi.

Locality: harbor of Talcahuano, Concepcion Bay, Chili.

HERPETOLOGY.

HYLIDÆ.

HYLA REGILLA, *Baird & Girard* [No. 8572].

Hyla regilla, BAIRD & GIRARD, Proc. Acad. Nat. Sci., Phila., 1852, 174; 1853, 301.—BAIRD, P. R. R. Rep., x, 1859, Williamson & Abbott's Route, Reptiles, 12, pl. 28, f. 3.—GIRARD, Herp. U. S. Expl. Exped., 60, pl. 3, f. 13–18.—COOPER & SUCKLEY, Nat. Hist. Wash. Terr., 1860, 304.—COPE, Check-list, 1875, 30.

Hyla scapularis, HALLOWELL, Proc. Acad. Nat. Sci. Phila., 1852, 183; P. R. R. Rep. x, 1859, Williamson's Route, Reptiles, 21.

Locality: Cerros Island, off the Pacific coast of Lower California. Near a spring of fresh water on the southeastern side of the island. Ground-color green; a narrow, deep-brown band extending from the nostril to the anterior margin of the orbit; a broader band of the same color from the posterior border of the orbit to the shoulder; the latter band margined below by a narrow rim of orange about half the breadth of the brown vitta; the side of the body between the shoulder and thigh spotted with brown; a V-shaped spot of brown between the eyes; two bands of the same color, one on either side the dorsal region, extending from the occiput to the sacrum; an oblong spot on the middle of the sacrum. The extremities ornamented with transverse series of broad spots. The entire under surface of the body yellow.

Heretofore this frog has been strictly confined to the Pacific region, where it is quite common. This is the first notice we have of its living in the Lower Californian region. The most southern locality whence it has been obtained previous to this is Tejon Pass (Hallowell, *P. A. N. S. Phila.*, 1852) in the southern portion of Alta California.

GECCONIDÆ.

DIPLODACTYLUS UNCTUS, *Cope* [No. 8571].

Diplodactylus unctus, COPE, Proc. Acad. Nat. Sci. Phila., 1863, 102; Check-list, 1875, 50.

Locality: Triunfo, Lower California.

The only way in which this specimen differs from Cope's original description is in the arrangement of the color on the back. Though the plan of arrangement is the same, yet, instead of the color being placed so as to form five continuous blackish cross-bands from the base of the tail to the interscapular region, the bands are more or less interrupted, thereby giving to the region somewhat of a marbled appearance.

IGUANIDÆ.

PHRYNOSOMA HERNANDEZI, Cope [No. 8567].

Phrynosoma hernandezi, COPE, Check-list, 1875, 48.

Tapaya hernandezi, GIRARD, Herp. U. S. Expl. Exped., 1858, 395.—BAIRD, P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 38; U. S. and Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 8.

Locality: Sonora, Mexico. Found living on the low, sandy, desert-like plains along the gulf coast. One of these interesting little animals was kept as a pet on board the ship until it died. After its death, its body was preserved in alcohol. When the collection was being examined attentively, in view to the determination of the species, the throat, mouth, and nostrils of this one were found to be completely clogged up with parasites, small round worms, from a half to three-quarters of an inch long. Its diet while in captivity consisted exclusively of flies and cockroaches, and it is highly probable that from the one or the other of these insects originated the parasites. The latter are now in the hands of an eminent helminthologist for determination.

SAUROMALUS ATER, Duméril [No. 8563].

Sauromalus ater, "DUMÉRIL, Arch. du Mus."—COPE, Check-list, 1875, 47.—COUES, Wheeler's Geographical and Geological Explorations and Survey West of the 100th Merid., vol. v, 1875, Zoöl., 600.

Euphryne obesa, BAIRD, Proc. Acad. Nat. Sci. Phila., 1858, p. 253; U. S. and Mex. Bound. Surv., ii, pt. ii, 1859, 6, pl. 27.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 310.—YARROW, Wheeler's Geographical and Geological Explor. and Surv. West of the 100th Merid., vol. v, 1875, Zoöl., 559.

Locality: Angel Island, Gulf of California. Abundant on this island. The largest specimen procured measured 22 inches in length. The old individuals are marked with one, two, or three large, rounded or irregular, grayish blotches somewhere on their body. They were easily captured by hand as they lay in the grass, sunning themselves. They eyed us timidly as we moved them about with our feet; then, apparently perceiving their danger, would start up and run with considerable swiftness to their burrows, which are generally in the midst of a dense clump of bushes, or under rocks. When once in their holes, so tenaciously do they hold on with their stout claws that the strength of a single person is not sufficient to drag them out. Their bleached remains scattered about over the island attest that they fall easy victims to the birds of prey.

Excretæ, supposed to be of this Lizard, deposited in the National Museum at Washington, and collected from the high lands of Utah and New Mexico by Dr. Yarrow, of Wheeler's Geographical and Geological Survey, bear no resemblance to what was seen common around the mouths of their burrows on Angel Island. In the first place, the excrement was not deposited in masses, but was scattered about. The scybalæ were oblong, and seemingly composed of the shells of seeds and other indigestible matter of plants. They were dry and porous, and so loosely held together that they could be readily pulverized under the foot.

UTA STANSBURIANA, *Baird & Girard* [Nos. 8570, 8569].

Uta stansburiana, BAIRD & GIRARD, Proc. Acad. Nat. Sci. Phila., 1852, 69; Stansbury's Rep. Exped. Great Salt Lake, 345, pl. 5, f. 4-5.—BAIRD, U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 7; P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 37.—COPE, Check-list, 1875, 48.—YARROW, Wheeler's Geogr. and Geolo. Expl. and Surv. West of the 100th Merid., v, 1875, Zoöl., 568.—COUES, op. cit., v, 1875, Zoöl., 596.

Locality: Cerros Island, off the Pacific coast of the peninsula of Lower California, and also from the mainland. The color of the male is brown above, with whitish-yellow irregular dots. The double row of dorsal patches of a deeper black, which is sometimes observed in this species, is more or less confluent into four longitudinal lines in our specimen. The female is uniformly pale olive above. Both sexes are yellowish below, greenish along the sides, and bluish under the throat There is also present in both sexes a deep indigo spot on the sides, just posterior to the axilla.

CHIROTIDÆ.

CHIROTES CANALICULATUS, *Cuvier* [No. 8568].

Le Canellé, LACÉP., Hist. Quad. Ovip., i, 613, pl. 41.

Le Bimane canellé, CUV., Règne Anim., (1re édit.) ii, 57; (2re édit.) ii, 67.

Bipes canaliculatus, BONNAT., Encyclop. Erp., 68, pl. 12, f. 6.—LATR., Hist. Nat. Rept. ii, 90.

Lacerta lumbricoides, Shaw, Nat. Misc., vi; Gener. Zoöl., iii, 311.
Lacerta mexicana, Donnd., Zoöl. Beit., iii, 135.
Lacerta sulcata, Suckow, Thier., iii, 147.
Chalcides propus, Daud., Hist. Rept., iv, 372, pl. 58, f. 4.
Chamæsaura propus, Schneid., Hist. Amphib., ii, 211.
Bimanus propus, Oppel., Die Ordnung. Famil. und Gattung. Rept., 46.
Chirote mexicain, Bory. de Saint Vincent, Résumé d'Erpet., 141, pl. 27, f. 1.
Chirotes lumbricoides, Flem., Ph. Zoöl., ii, 278.—Eichw., Zoöl. Spec. Ross. Polon., iii, 180.—James, Long's Exped. to the Rocky Mts., i, 484.—Harlan, Jour. Acad. Nat. Sci. Phila., vi, 55.—Gray, Cat. Tort., 1844, 74; Cat. Shield Rept., pt. ii, 34.
Chirotes canaliculatus, Dum., Collect. Mus. Par.—Merrem., Tent., 181.—Fitz., Neue Classif. Rept., 53.—Guér., Icon. Règne Anim. Cuv. Rept., pl. 16, f. 3.—Schinz, Naturg. und Abbild. Rept., 107, pl. 41, f. 2.—Dum. & Bib., Hist. des Rept., v, 1839, 474.—Gray, P. Z. Soc., 1865, 446.

Locality: La Paz, Lower California. Obtained through the agency of the United States consul at La Paz. The Mexican name for this reptile is *ajolote*, which, however, cannot be considered as specific or even generic, as it is applied to several species of *Amphisbænidæ*. I was informed that it lives mostly underground, coming out only at night. Its rudimentary eyes and the arrangement and shape of the feet, which are similar to those of the mole, would suggest subterrestrial habits, as would also the absence of coloring matter in its integument. The specimen obtained in Lower California differs in no respect from the description given in Duméril and Bibron's "Histoire des Reptiles". Reference to the above biographical notice will show that it has been extensively quoted as coming from Mexico, which so far has been regarded as its only habitat. The only assurance we have of its ever having been found within the limits of the United States rests upon the somewhat doubtful statement in "Long's Expedition to the Rocky Mountains". The testimony is as follows:—"We observed, in repeated instances, several individuals of a singular genus of Reptiles (*Chirotes*, Cuv.), which in form resemble short Serpents, but are more closely allied to the Lizards by being furnished with two feet. They were so active that it was not without some difficulty that we succeeded in obtaining a specimen. Of this (as was our uniform custom when any apparently new animal was presented) we immediately drew out a description. But as the specimen was unfortunately lost, and the description formed part of the zoölogical notes and observations, which were carried off by our deserters, we are reduced to the necessity of merely indicating the probability of the existence of the *Chirotes lumbricoides* of naturalists within the territory of the United States."—(Vol. i, p. 484.) As no mention is made as to whether the two feet observed were the anterior or posterior pair, it is possible that the animal here noticed might have been one of the *Scincidæ*, which are also characterized by only one pair of feet, which are the posterior, however, instead of the anterior, as in *Chirotes*. Professor Cope does not include it in his "Check-list of North American Batrachia and Reptilia", which embraces the reptilian fauna of Lower California.

CROTALIDÆ.

CROTALUS PYRRHUS, *Cope* [No. 8562].

Crotalus pyrrhus, COPE, Check-list, 1875, 33.

Caudisoma pyrrha, COPE, Proc. Acad. Nat. Sci. Phila., 1866, 308, 310—COUES, Wheeler's Geographical and Geological Explorations and Surveys West of the 100th Meridian, vol. v, 1875, Zoölogy, 608, pl. xxii.

Locality: Angel Island, Gulf of California. This is the first notice of the occurrence of this rare and interesting rattlesnake since the date of its original description by Professor Cope, in 1866, and, as far as I am able to discover, it is the second specimen in existence in any museum.* It is readily distinguishable from all other members of the family, except *C. mitchelli*, by the presence of scales between the prenasals and the rostral; and from the latter by the greater subdivision of the plates of the head—*C. mitchelli* having but one loreal, whilst in *pyrrhus* there are four.

The general style of coloration is much the same as given in the description and plate (Wheeler's Report), except that the colors in the recent specimen have somewhat faded in alcohol. The ground-color is a pinkish-gray instead of a salmon color. An exact tint, however, cannot be a point of much specific importance in reptiles, as they are known to be susceptible of a certain range of variation in their colors, in order to harmonize with the color of the ground on which they happen to be lying. The markings along the back are reddish-bay. These markings consist of a dorsal row of large hexagonal spots and a lateral row of smaller spots opposite the dorsal patches. On the anterior third of the length of the body, the hexagons are small and regular in outline, and are separated from the lateral spots by a well-defined interspace; on the middle third, they become more transverse, the lateral angles coalescing with the row on the sides; and, on the posterior third of the length, all the markings have run together completely, being transformed into regular transverse bands. Three black half-rings on the tail. Some of the scales of the rows surrounding the dorsal patches are black-tipped. There is a heightening of the ground-color on the sides in the intervals between the lateral spots, corresponding to what Professor Cope describes as vermilion-colored spots. The bright lemon-colored spots in the same region have disappeared. The total length of the snake is 3½ feet.

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* Since the above was written, the head of a third specimen has been found in the reserve series of the National Museum.

CROTALUS ADAMANTEUS ATROX, *Cope* [No. 8564].

Crotalus adamanteus atrox, COPE, Check-list, 1875, 33.

Crotalus atrox, BD. & GIR., Cat. N. Amer. Rept., 1853, 5, 156.—BD., P. R. R. Rep., x, 1859, Whipple's Route, Reptiles, 39, pl. 24, f. 3; U. S. and Mex. Bound. Surv, ii, pt. ii, 1859, Reptiles, 14, pl. i.

Caudisoma atrox, COPE, Mitchell's Res., 1861, 121; Proc. Acad. Nat. Sci. Phila., 1863, 309.

Caudisoma adomantea atrox, COUES, Wheeler's Geographical and Geological Explorations and Surveys West of the 100th Meridian, vol. v, Zoölogy, 1875, 607.

Locality: Los Coronados Islands, Pacific coast of Lower California.

ELAPIDÆ.

ELAPS EURYXANTHUS, *Kennicott* [No. 8566.]

Elaps euryxanthus, KENNICOTT, Proc. Acad. Nat. Sci. Phila., 1860. 337.—COPE, Proc. Acad. Nat. Sci. Phila., 1866, 307; Check-list, 1875, 34.—COUES, Wheeler's Geographical and Geological Explorations and Surveys West of the 100th Meridian, vol. v, 1875, Zoölogy, 611.

Locality: Tiburon Island, Gulf of California.

COLUBRIDÆ.

PITYOPHIS SAYI BELLONA, *Cope* [No. 8565].

Pityophis sayi bellona, COPE, Check-list, 1875, 39.—COUES, Wheeler's Geographical and Geological Explorations and Surveys West of the 100th Meridian, vol. v, 1875, Zoölogy, 617.

Churchillia bellona, BD. & GIR., Stansbury's Rep. Exp. Great Salt Lake, 1852, 350.

Pityophis affinis, HALLOW., Proc. Acad. Nat. Sci. Phila., 1852, 181; Sitgreaves's Exped. Zuñi & Colorado Riv., 1853, 130, 146, pl. 10.

Pityophis bellona, Bd. & Gir., Cat. N. Amer. Rept., 1853, 66, 157.—Kenn., *apud* Bd., P. R. R. Rep., x, 1859, Williamson's Route, Reptiles, 42.—Bd., P. R. R. Rep., x, 1859, Beckwith's Route, Reptiles, 19.—Kenn., *apud* Bd., U. S. & Mex. Bound. Surv., ii, pt. ii, 1859, Reptiles, 19.—Cope, Proc. Acad. Nat. Sci. Phila., 1866, 305.—Allen, Proc. Boston Soc. Nat. Hist., xvii, 1874, 69.

Locality: Saint Martin's Island, Pacific coast of Lower California. In our specimen, there is but one anterior orbital on a side; postorbitals three. On the left side, there are two prefrontals; the adventitious one is quite small, and is situated at the inner edge of the larger and normal prefrontal plate of the same side, between the rostral and the left internal postfrontal. Nine superior labials on each side, the eye resting on the fifth. In those cases where there are but eight labials on a side, the eye always rests on the fourth, and invariably on the fifth when nine plates are present. The additional plate is inserted anterior to the position of the eye; and in those cases the head is more elongate.

The whole of this small collection of reptiles, with two exceptions, came from the outlying islands along the coasts of the peninsula of Lower California. They can be arranged into two groups, representing, one the Pacific, and the other the gulf islands, accordingly as they are related to the two regions north of them; namely, the Pacific and Sonoran:

I. Types purely Sonoran, including all those that came from the gulf region:

Phrynosoma hernandezi.
Sauromalus ater.
Crotalus pyrrhus.
Elaps euryxanthus.

II. Types purely Pacific, or species belonging as well to the Pacific as to the Sonoran region, including all those that came from the Pacific coast:

Hyla regilla.
Uta stansburiana.
Crotalus adamanteus atrox.
Pityophis sayi bellona.

I desire especially to direct attention to the occurrence on Angel Island of two highly characteristic Arizonian reptiles, the *Sauromalus ater* and *Crotalus pyrrhus.* These have heretofore been confined to Arizona, and they are by no means common there. The naturalists of Wheeler's Survey have explored the Southwestern Territories for three successive seasons, and have failed to add a single specimen of either to their collections. Their presence on Angel Island, which is situated in the gulf about midway its length, may be readily explained when we consider the geological changes that have taken place since the post-tertiary period. The study of the geological formation of all the outlying islands of the peninsula, both in the gulf and on the Pacific coast, convinced me that they were at one time portions of the mainland; the study of their fauna strengthens this conclusion. Fringing the mainland, and overlying the other formations on the islands, is a deposit of post-tertiary origin. There was an extensive upheaval during that period, and then it was that the islands probably formed a part of the peninsula, subsidence taking place subsequently. So far has this depression gone on—and it is probably going on at present—that some of the islands are now separated from the mainland by water a thousand feet deep. If we carry ourselves back to the time when they formed a part of the mainland, we will have the mouth of the Colorado River discharging its water into the gulf somewhere about the present site of Angel Island. So that it is not difficult to account for the presence of these reptiles on this now isolated bit of land, which was then connected with the Arizonian region by a continuity of surface.

ICHTHYOLOGY.

I.—*Fishes of Upper and Lower California.*

DIODONTIDÆ.

DIODON MACULATUS, *Lacép.* [No. 17540].

Diodon tacheté, LACÉP., Poiss., ii, 1801, p. 13.

Diodon novemmaculatus, CUV., Mém. Mus. Hist. Nat., iv, 1818, 136, pl. 6.—BLEEK., Nat. Tyds. Ned. Ind., iii, 1852, 567.

Diodon sexmaculatus, CUV., op. cit., iv, 1818, 136, pl. 7.—KAUP, Arch. Naturgesch., xxi, i, 1855, 229.

Diodon multimaculatus, CUV., op. cit., iv, 1818, 136, pl. .—KAUP, op. cit., xxi, i, 1855, 227.

Diodon quadrimaculatus, CUV., op. cit., iv, 1818, 137, pl. 6.—BLEEK., Act. Soc. Sc. Indo-Neerl., ii, Amboina, viii, 94.

Diodon spinosissimus, KAUP, Arch. Naturgesch., xxi, i, 1855, 228 (not Cuvier).

Paradiodon novemmaculatus, BLEEK., Atl. Ichth., v, 1865, 57, pl. 206; *Gymnod.*, pl. 2, f. 3.

Paradiodon quadrimaculatus, BLEEK., Atl. Ichth., v, 1865, 58, pl. 212; *Gymnod.*, pl. 8, f. 2.

Diodon maculatus, GTHR., Cat. Fishes, viii, 1870, 307.

Locality: Lower California.

Our species corresponds to var. *a* of Günther. It presents some points of difference, which we will note. The frontal row of spines the longest; nearly all the spines of the back and sides are longer than the diameter of the eye. The black band between the eyes does not extend completely across the interorbital space, but is interrupted in the center; it extends downward behind the eyes. The color is distributed over the rest of the body as follows:—A vertical band beneath the eye; a broad band across the nape of the neck; a large round spot on either side above and behind the base of the pectoral fin; a large triangular spot, with apex truncated, in the middle of the back; a V-shaped spot more posteriorly, diverging anteriorly, and with the base of the dorsal fin situated in the angle. Besides these, there are a number of small round spots scattered over the back and sides, one of which, larger than the rest, on the side, is situated behind and on a line with the inferior edge of the pectoral fin.

Length, 6 inches.

COTTIDÆ.

LEPTOCOTTUS ARMATUS, *Gir.* [No. 12963].

Leptocottus armatus, GIRARD, Proc. Acad. Nat. Sci. Phila., vii, 1854, 131–145; viii, 1856, 133; P. R. R. Report, x, 1858, Fishes, 60, pl. 15, f. 2.

Acanthocottus inermis, AYRES.

Centridermichthys armatus, GÜNTHER, Cat. Fishes, ii, 1860, 171.

Locality: Mare Island, Cal.

Günther queries Girard's statement that the end of the upper maxillary bone extends beyond the vertical from the posterior margin of the orbit. In our six specimens from Mare Island, varying in length from 3.50 to 5 inches, it reaches in every example either to or beyond the vertical from the posterior margin of the orbit. We find nothing wanting to complete Girard's excellent description of this fish.

SCORPÆNIDÆ.

SEBASTOMUS AURICULATUS, (*Gir.*) *Gill* [No. 12964].

Sebastes auriculatus, GIRARD, Proc. Acad. Nat. Sci. Phila., 1854, 131; P. R. R. Report x, 1858, Fishes, p. 80.—AYRES, Proc. Cal. Acad. Nat. Sci., ii, 1853, 218, f. 68; Proc. Zoöl. Soc. London, 1863, 394, fig.

Sebastes ruber, var. *parvus*, AYRES, Proc. Cal. Acad. Nat. Sci., i, 1854, 7.

Sebastichthys auriculatus, GILL, Proc. Acad. Nat. Sci. Phila., 1862, 278.

Sebastomus auriculatus, GILL, MSS.

Locality: San Francisco, Cal. Caught at the wharves of Mission Bay.

LABRIDÆ.

PIMELOMETOPON PULCHER, (*Ayres*) *Gill* [No. 17551].

Labrus pulcher, AYRES, Proc. Cal. Acad. Nat. Sci., i, 1854, v. 3; Proc. Boston Soc. Nat. Hist., v, 1854, 101.

Semicossysphus pulcher, GÜNTHER, Ann. and Mag. Nat. Hist., series iii, viii, 1861, 384; Cat. Fishes, iv, 1862, 99.—GILL, Proc. Acad. Nat. Sci. Phila., 1863, 330.

Pimelometopon pulcher, GILL, Proc. Acad. Nat. Sci. Phila., 1864, 58.

Locality: Pacific coast of Lower California.

D. $\frac{12}{10}$. A. $\frac{3}{12}$. L. lat. 58.

Height of the body equals the length of the head, and is contained not quite four times in the total length. Height of the head equals its length. But three large anterior canine teeth in each jaw (probably an abnormal number); posterior canine present in the upper jaw. The superior maxillary does not reach to the vertical from the anterior margin of the orbit. Caudal fin deeply concave behind, angles produced. The anterior portion of the body from behind the gill-opening to a line drawn vertically from the commencement of the soft dorsal to the anal fin reddish (in alcohol); posteriorly blackish-brown; head blackish-brown, except lower jaw and chin, which are reddish-white. (Ayres states the chin to be white in life.) The color on the chin extends backward to a line drawn obliquely downward from the angle of the mouth. A light-colored vertical band on the posterior margin of the caudal; posterior extremities of soft dorsal and anal lighter colored.

Total length, 27 inches; height of the body at its greatest elevation, 7 inches.

EMBIOTOCIDÆ.

CYMATOGASTER AGGREGATUS, *Gib.* [No. 12966].

Micrometrus aggregatus, GIBBONS, Proc. Acad. Nat. Sci. Phila., vii, 1854, 125.—A. AGASSIZ, Proc. Boston Soc. Nat. Hist., 1861, 128.

Cymatogaster aggregatus, GIBBONS, Proc. Acad. Nat. Sci. Phila., vii, 1854, 106.—GILL, Proc. Acad. Nat. Sci. Phila., 1862, p. 275 (foot-note).

Holconotus rhodoterus, GIRARD, Proc. Acad. Nat. Sci. Phila., vii, 1854, 141, 152; 1855, 322; P. R. R. Report, x, 1858, 193, pls. 35 and 36, figs. 1–4; pl. 26, f. 7 and 8.—SUCKLEY, Nat. Hist. Wash. Terr., 1860, 358 (nec Agass.).

Metrogaster aggregatus, A. AGASSIZ, Proc. Boston Soc. Nat. Hist., 1861, 133.

Ditrema aggregatum, GÜNTHER, Cat. Fishes, iv, 1862, 248.

Locality: Mission Bay, San Francisco, Cal.

In Günther's Catalogue of Fishes, Vol. iv, p. 248, we find the following foot-note in reference to Girard's figure: "If the figure of pl. 36 has really been drawn from a specimen of this species, the control over the artist must have been very careless, the scales being represented much too small." The eminent authority whom we have just quoted evidently had the upper figure of the plate, *Amphistichus similis*, in which the scales are correctly represented small, in his mind's eye when he charged the American ichthyologist with being careless; otherwise, we cannot see how he made the mistake which he did. We can certify by actual measurements that the scales of *Holconotus rhodoterus*, the fish in question, are sufficiently accurately represented in figure 1, plate 36, and are of the same size as those of the figures on the preceding plate, concerning which the gentleman is silent, leaving us to infer that they are correct in that respect.

TRICHIURIDÆ.

TRICHIURUS LEPTURUS, *Linn.* [No. 17545].

Trichiurus lepturus, Linn., Syst. Nat., i, 1766, 429.—Bl. Schn., Syst. Ichth., 1801, 517.—Cuv. & Val., Hist. Nat. des Poiss., viii, 1831, 237.—Yarrell, British Fishes, i, 1841, 204.—Storer, Boston Jour. Nat. Hist. iv, 1844, 181.—Casteln. Anim. nouv. ou rares Amer. Sud, 1855, 24.—Dekay, Zoöl. New York, Fishes, 1842, 109, pl. 12, f. 35.—Guichen, Poiss. in Romon de la Sagra, Hist. Cuba, 1845, 105.—Günther, Cat. Fishes, ii, 1860, 346.

Trichiurus argenteus, Shaw, Zoöl., iv, 1803, 90, pl. 12.—Mitch., Trans. Lit. and Phil., Soc., New York, i, 1815, 364.

Lepturus argenteus, Gill, Proc. Acad. Nat. Sci., Phila., 1863, 226.

The height of the body, at the situation of the pectoral fin, is contained $17\frac{1}{2}$ in the total length, and the length of the head is 7 times in the same. The eye occupies half of the depth of the head; its diameter is slightly more than the interorbital space, and it is contained 6 times in the length of the head and $1\frac{4}{9}$ times in the length of the snout. The latter is $3\frac{1}{3}$ times in the head-length. Height of pectoral fin is $\frac{2}{3}$ of the height of the body, and is contained $26\frac{1}{4}$ times in total length; tail, from the extremity of the dorsal fin, $5\frac{5}{6}$ in the same, and from the last spine on the lower surface of the body, $10\frac{1}{2}$ times. Anus placed at the junction of the anterior and middle thirds of the length; behind anus are 98 small spines. Dorsal rays, 122; pectoral, 11. Lateral line below the middle of the body. Silvery, with a dark metallic luster along the back. Length, 10.50.

Locality: Mouth of the Colorado River, Gulf of California.

We do not hesitate to refer this species to the *Trichiurus lepturus* as it is illustrated by specimens coming from the Gulf of Mexico, which are found to have a relatively longer tail. Günther's statement that the diameter of the eye is contained three times in the length of the snout is an error, if applied to the Western Atlantic species. We have measured nine specimens, obtained from seven different localities on the Atlantic and Gulf coasts, and find it to vary from $1\frac{5}{7}$ to $2\frac{2}{5}$. In four specimens the snout was twice the diameter of the eye, in three it was more than twice, and in two it was less than that number. We have not been able to find any good specific characters for the different species of *Trichiurus*. The species are founded principally upon locality and the relative proportions of the different parts of the body; yet if all those from the Atlantic be accepted as belonging to one species—*lepturus*—we find there to be a considerable variation in their proportions. We subjoin tables to illustrate this variation, as well as to show the affinities of the species from the Gulf of California with those found in the Gulf of Mexico, and also the relations of *haumela* with specimens from the Caribbean Sea. The specimens of *haumela* from which the measurements were taken came from the Indian Ocean, through the British Museum. The proportions from Cuvier and Valenciennes are taken as the standard for comparison.

	Lepturus.		
	C. & V.	New York.	Cuba.
Height in total	16–17	$16\frac{2}{11}$	$16\frac{2}{5}$
Head in total	8	$8\frac{1}{4}$	$8\frac{1}{5}$
Snout in head	$2\frac{2}{3}$	3	—3
Eye in head	6	6	$6\frac{1}{4}$
Eye in snout	$2\frac{1}{4}$	2	$2\frac{1}{8}$
Tail in total	7	7	6

	Lepturus.			
	Lower California.	Texas.	Florida.	Mississippi.
Height in total	$17\frac{1}{2}$	$17\frac{2}{3}$	$17\frac{3}{5}$	$17\frac{1}{4}$
Head in total	7	$7\frac{1}{2}$	$7\frac{5}{9}$	—8
Snout in head	$3\frac{1}{8}$	+3	—3	—3
Eye in head	6	$5\frac{4}{7}$	$5\frac{4}{6}$	$5\frac{5}{6}$
Eye in snout	$1\frac{4}{9}$	$1\frac{6}{7}$	2	2
Tail in total	$5\frac{5}{6}$	6	6	$6\frac{9}{10}$

	Haumela.	Lepturus.	
	Indian Ocean.	Graytown, Nicaragua.	Graytown, Nicaragua.
Height in total	$15\frac{5}{9}$	$15\frac{1}{7}$	15
Head in total	7	$7\frac{2}{5}$	$6\frac{4}{7}$
Snout in head	$3\frac{1}{3}$	+3	—3
Eye in head	$6\frac{2}{3}$	$6\frac{5}{6}$	7
Eye in snout	2	$2\frac{1}{5}$	$2\frac{2}{5}$
Tail in total	7	$9\frac{2}{11}$	$8\frac{1}{2}$

LATILIDÆ.

CAULOLATILUS ANOMALUS, (*Cooper*) *Gill* [No. 17553].

Dekaya anomala, COOPER, Proc. Calif. Acad. Nat. Sci., iii, 1864, 70, f. 17.
Caulolatilus anomalus, GILL, Proc. Acad. Nat. Sci. Phila., 1865, 68.

D. $\frac{9}{25}$. A. $\frac{2}{24}$.

Greatest height of the body is contained $4\frac{1}{9}$ times in the total length, and the length of the head $4\frac{5}{9}$ in the same. The diameter of the eye is one-fifth of the length of the head, and the length of the snout one-third. The dorsal fin commences above the root of the pectoral, and extends to within a short distance of the caudal fin; its length is slightly more than one-half the total length; first dorsal spine the shortest—one-nineteenth of the total length of the fin; the longest spine between one-seventh and one-eighth; the longest soft ray between one-fifth and one-sixth; and the last ray about one-fifteenth of the length of the fin. The anal fin commences under the fourth soft dorsal ray, and terminates opposite the end of the dorsal; its length three-fifths of the length of the dorsal; its height one-fourth of its length. Pectoral long and pointed, somewhat shorter than the head; the middle ray the longest. Ventrals commence under the hinder margin of the base of the pectoral, and are contained $1\frac{2}{5}$ times in the length of the latter. Caudal peduncle is $12\frac{1}{3}$ times in the total length; its height about one-fourth of the greatest height of the body. Caudal fin about $6\frac{1}{2}$ times in the total length. Total length 18.50 inches.

Locality: Lower California.

SCIÆNIDÆ.

CYNOSCION SQUAMIPINNIS, (*Gthr.*) *Streets* [No. 17552].

Otolithus squamipinnis GÜNTHER, Proc. Zoöl. Soc. London, 1866, 601; Trans. Zoöl. Soc. London, vi, 1869, 429.

D. 9–$10\frac{1}{25}$. A. $\frac{2}{10}$.

Our specimens agree with Günther's description in every particular, except in the number of soft rays in the dorsal fin. The measurements are identical, as are also the arrangement of the scales and color. What is very characteristic of this fish is the condition of the dorsal and anal fins. It is the only species of this genus in which these fins are completely covered with scales. Our two specimens measure 25 and 26 inches in length.

Locality: Gulf of California, off the San Ignacio River, Sonora. We found them very abundant at this locality.

PRISTIPOMATIDÆ.

HÆMULON FLAVIGUTTATUM, *Gill* [No. 17543].

Hæmulon flaviguttatus, GILL, Proc. Acad. Nat. Sci. Phila., 1862, 254.—STEINDACHNER, Sitzb. Akad. d. Wiss., lxxii, 1875, Ichthyologische Beiträge, iii, 14.

Hæmulon margaritiferum, GÜNTHER, Trans. Zoöl. Soc. London, vi, 1869, 419, pl. 65, f. 2.

D. $12\frac{1}{15}$. A. $\frac{3}{10}$. L. lat. 53 to the caudal fin; 61 to its termination on the caudal fin. L. trans. $\frac{8}{15}$.

The measurements of our specimen agree with Professor Gill's, except in the lengths of the eleventh, twelfth, and thirteenth dorsal spines, which are subequal and shorter than the second spine. Total length 12 inches.

Locality: Lower California.

XENICHTHYS CALIFORNIENSIS, *Stein.* [No. 17541].

Xenichthys californiensis, STEINDACHNER, Sitzsber. Ak. Wiss. Munich, lxxii, 1875. Ichthyologische Beiträge, iii, p. 3.

We arrive at a positive identity of our species by comparison with Dr. Steindachner's excellent description. We may add, however, that the longitudinal bands above the lateral line are much more distinctly defined and of a darker color than those below. The upper are blackish-brown, and there are some irregular markings between them. There are always three bands above the lateral line; while those below may vary from four to five. The whole surface of the body, except the under parts, is covered with minute brown points.

Locality: Cerros Island, Pacific coast of Lower California.

PRISTIPOMA LEUCISCUS, *Gthr.* [No. 17539].

Pristipoma leuciscus, GÜNTHER, Proc. Zoöl. Soc., 1864, 147; Trans. Zoöl. Soc., vi, 1869, 416, pl. 56. f. 3.

D. $11\frac{1}{14-16}$. A. $\frac{3}{8}$. L. lat. 51. L. trans. $\frac{5-6}{10}$.

Darker above the lateral line than below. A black spot posteriorly in the axil of the pectoral fin. A dark longitudinal line, rather indistinct, corresponding to the center of each row of scales on the sides. The fins, and the scales on the sides and breast, dotted with minute points of black. We add these notes in regard to the color, for the reason that they are not mentioned in Günther's description, although they are represented in his figure.

Length of specimens 9.8 and 6.5 inches.

Locality: Lower California.

CONODON PLUMIERI, (*Bloch*) *Gthr.* [No. 17546].

Sciæna plumieri, BLOCH, Naturg. der ausländ. Fische, vi, 1785, 66, pl. 306.

Sciæna coro, BLOCH, Naturg. der ausländ. Fische, 1785, pl. 307, f. 2.—BLOCH, Syst. Ichth. ed. SCHN., 1801, 81.

Perca plumieri, BLOCH, Syst. Ichth. ed. SCHN., 1801, 85.—CUV. & VAL., Hist. Nat. des Poiss., ii., 1828, 57.

Centropomus plumieri, LACÉP., Hist. des Poiss., iv, 1803, 268.

Chilodipterus chrysopterus, LACÉP., op. cit., iii. 1803, 542, pl. 33, f. 1.

Conodon antillanus, CUV. & VAL., op. cit., v, 1830, 156.

Pristipoma coro, CUV. & VAL., op. cit., 1830, v, 266.—CUV., Règne Anim. Ill. Poiss., 1829–30, pl. 30, f. 2.—GÜNTHER, Cat. Fishes, i, 1859, 297.

Conodon plumieri, GÜNTHER, Cat. Fishes, i, 1859, 304.—TROSCHEL, In MÜLLER, Wirbelth. Mex., 91.

The height of the body is one-fourth of the total length, and the length of the head is contained 3⅗ times in the same. The diameter of the eye is exactly one-fourth of the length of the head; the snout is somewhat longer. The lower jaw projecting in advance of the upper; the extremity of the upper maxillary bone extending slightly beyond the vertical from the anterior margin of the orbit. An external row of short, stout, conical teeth, the four or six anterior in each jaw larger and longer than those on the sides; behind the external row a band of villous teeth. Both limbs of the præoperculum armed with distant, sharp, spinous teeth; those on the posterior limb directed upward, while those on the horizontal limb are directed forward; at the angle of the two borders is one long and stout spine, directed backward and projecting considerably beyond the posterior border; posterior border slightly concave. Angle of the operculum obtuse. The dorsal fin deeply notched; the fourth spine being the longest, about equaling half the length of the head; first and second dorsal spines short. The second anal spine is very stout and striated, and of the same length as the fourth dorsal. Pectoral pointed, the sixth ray being the longest, about one-fifth of the total length. Ventrals inserted behind the pectorals, shorter than the latter and do not extend as far backward.

All the specimens obtained gave the following formula:

D. $11\frac{1}{12}$. A. $\frac{3}{7}$. L. lat. 50–51. L. trans. $\frac{6}{12}$.

Body silvery, darker above the lateral line, sides with eight vertical bars of dark brown descending from the dorsum to about the middle of the height of the body. The first descends from the nape of the neck; three begin along the base of the spinous dorsal; two from the soft dorsal; and two on the caudal peduncle.

We cannot distinguish this fish from the *Pristipoma coro* and *Conodon antillanus* of Cuvier and Valenciennes. It agrees with them in every essential particular. It will be observed, however, that the above description differs from Günther's in the following particulars:—The height of the body is one-fourth of the total length, instead of being contained in it $3\frac{1}{2}$ times; the posterior limb of the præoperculum is slightly concave, instead of descending obliquely backward; and, finally, there is but one strong spinous projection at the angle, instead of two. Cuvier in none of his descriptions mentions more than one strong spinous tooth at the angle.

Lengths 8, 7.25, 6.80 inches.

Locality: Boca Solidad, Pacific coast of Lower California.

SERRANIDÆ.

EPINEPHELUS ROSACEUS, *Streets*, n. sp. [No. 17554].

D. $\frac{11}{17}$. A. $\frac{3}{11}$. P. 16. V. $\frac{1}{5}$.

Height of the body somewhat less than the length of the head, and about $3\frac{2}{3}$ times in the total length, including the caudal fin; without caudal, three times. Length of the head is contained about $3\frac{1}{6}$ times in the total length, including caudal, and $2\frac{2}{3}$ without caudal. Dorsal outline arched, and the front descends in a nearly straight line from the commencement of the dorsal fin to the point of the snout. The length of the snout more than twice the diameter of the eye; and the latter is contained seven times in the length of the head. The interorbital space convex, and much broader than the diameter of the eye. Cleft of the mouth slightly oblique; lower jaw projecting; the end of the upper maxillary reaches to the vertical from the middle of the eye. Two or three large canine teeth in each jaw anteriorly, those in the lower jaw slightly smaller; an external lateral row of canines in each jaw. On the sides an internal series of movable teeth; on the lower jaw in front there is a short villiform band between the canines and movable teeth; on the upper jaw the movable teeth are intermediate between the canines and villiform band. Teeth on the vomer and palatines; on the first-named forming a triangular band. The præoperculum slightly notched above the angle; the posterior margin and angle finely serrated; the inferior border as well as the free margins of the sub- and interoperculum smooth. The membranous border of the operculum produced behind the spines to an acute point; the middle of the three spines the largest, and placed nearer the lower than the upper spine of the border. The dorsal fin commences directly above the base of the pectoral; the third and fourth spines are the longest, but shorter than the posterior rays of the soft dorsal; first spine about one-half the length of the second. Spinous portion of the fin lower than the soft; the posterior rays of the latter the longest. Anal commences about under the sixth soft dorsal ray, and ends before the termination of the dorsal; the first spine very short, the second more than one-half the length of the third; the anterior rays prolonged, the fifth and sixth the longest; the posterior border emarginate. Pectorals rounded posteriorly, about one-half the length of the head, a large fleshy flap in the superior axil. Ventrals somewhat shorter than the pectorals, and commence just behind their base, and do not extend to the vent. Caudal slightly emarginate, and constitutes about one-fifth of the total length of the body.

Color (in life) uniformly rosaceous; (in alcohol) golden-yellow.

Total length, 20.50 inches; height, 5.50; head, 6.50.

Locality: Gulf of California, in the vicinity of Angel Island.

DIPLECTRUM RADIALIS, (*Q. & G.*) *Streets* [No. 17550].

Serranus radialis, QUOY & GAIMARD, Voy de Freyc, Poiss., 1824, 316.—CUV. & VAL. Hist. Nat. des Poiss., ii, 1828, p. 243.

Centropristis radialis, GÜNTHER, Cat. Fishes, i, 1859, 83.—STEINDACHNER, Sitzb. der K. Akad. der Wiss., lxxii, 1875, Ichthyologische Beiträge, iv, 6.

Centropristis ayresi, STEINDACHNER, Sitzb. d. K. Akad. d. Wiss., lvii, 1868, Ichythyologische Notizen., vii, 1, pl. 1, f. 1.

Centropristis macropomus, GÜNTHER, Trans. Zoöl. Soc. London, vi, 1869, 409, pl. 65, f. 1.

D. $\frac{10}{13}$. A. $\frac{3}{7}$. L. lat. 50. L. trans. $\frac{6}{16}$.

Angle of the præoperculum enlarged, rounded, striated, and armed with strong spines; those of the right side showing a tendency to separate into two fasciculi, as in *D. fascicularis;* a notch above the angle; the posterior margin oblique and finely serrated; the inferior border serrated, and the stout spines from the angle extend further along on this border than up the posterior, and the gradation is less abrupt; nine series of scales between the eye and the angle of the præoperculum. The end of the upper maxillary reaches nearly or quite to the vertical from the posterior margin of the orbit. Dorsal fin with a notch; the ninth spine being exactly the same length as the tenth.

The colors on the side of the body have somewhat the same arrangement as is observed in *C. radians*. There are eight transverse streaks between the angle of the operculum and the base of the caudal fin, and these are crossed along their middle by a longitudinal band. All these markings are more or less indistinct. An irregular black blotch at the base of the caudal fin. Soft dorsal and caudal spotted. Ground color yellowish.

Total length, 9.50 inches; length of the head contained 3½ times in the total length; the greatest height of the body is a little more than one-quarter of the total length.

Locality: Bay of La Paz, Lower California.

The only characters that are peculiar to the species described by Günther are the six rows of scales between the eye and the angle of the præoperculum, and the longer tenth spine of the spinous dorsal. These are of extremely doubtful importance to found a new species upon, inasmuch as the species is recognized as subject to local or individual variation.

ECHENEIDIDÆ.

ECHENEIS REMORA, LINN. [No. 17547].

Echeneis remora, LINN., Syst. Nat., i, 1766, 446; Amœn. Acad., 1, 1749, 320, and Mus. Reg. Ad. Fred., i, 1754, 75.—OSBECK, Voy. China, 1771, 94.—SCHŒPFT, Schrift. Gesellsch. Naturg. Freunde, Berlin, viii, 3, 145.—BL., Naturg. der ausländ. Fische, ii, 1785, 134, pl. 172.—BL., Syst. Ichth., ed. SCHN., 1801, 240.—LACÉP., Hist. des. Poiss., iii, 1803, 146, 147, pl. 9, f. 1.—CUV., Règne Anim., 1817.—BLUMENB., Abbild., 1810, pl. 78.—RISSO, Ichth., Nice, 1810, 177; Eur. Merid., iii, 1827, 269.—SHAW, Zoöl., iv, 1803, 202, pl. 31.—MÜLLER, Prodr. Faun. Dan., 1777, no. 361.—MITCH., Trans. Lit. & Phil. Soc. New York, i, 1815, 378.—TURTON, Brit. Faun., 94.—RICHARDS, Faun. Bor. Amer., 1836, 265.—FABER, Fische Islands, 115.—SCHLEG., Faun. Japon. Poiss., 1850, 271.—DEKAY, Zoöl., New York, Fishes, 1842, 309.—LOWE, Trans. Zoöl. Soc. London, iii, 16.—BENN., Whaling Voy., 271.—JENYNS, Zoöl., Beagle, Fishes, 1842, 142.—YARRELL, Brit. Fishes, i, 3d edit., 1859, 670.—GÜNTH., Ann. & Mag. Nat. Hist., 1860, 390; Cat. Fishes, ii, 1860, 378; Jour. Mus. Godeff. Heft., xi, 1876, Fische der Sudsee, Heft., v, 156.—GILL, Proc. Acad. Nat. Sci. Phila., 1864, 60.

Echeneis naucrates, RISSO., Eur. Merid., iii, 1827, 270.

Echeneis Jacobæa, LOWE, Proc. Zoöl. Soc. London, 1839, p. 89; Trans. Zoöl. Soc. London, iii, 17.

Echeneis pallida, LOWE, op. cit., 1839, 89; op. cit., iii, 16, (nec Schleg.).

Echeneis romoroides, BLEEK., Nat. Tyds. Ned. Ind., ii, 1855, Batœ, 70.

Echeneis parva, GRONOV., (1780), Syst. ed., Gray, 1854, p. 92.

Remora Jacobæa, GILL, Proc. Acad. Nat. Sci., Phila., 1862, 240; 1863, 88.

Locality: Bay of La Paz, Lower California.

This, along with the following species, was found on the body of a large sea-devil (*Ceratoptera*), caught in the Gulf of California.

ECHENEIS ALBESCENS, *Schleg.* [No. 17544.]

Echeneis albescens, SCHLEG. Faun. Japon., Poiss., 1850, 272, 120, f. 3.—GÜNTHER, Cat. Fishes, ii, 1860, 377; Jour. Mus. Godeff. Heft., xi, 1876, Fische der Sudsee, Heft., v, 155.—BLEEKER, Act. Soc. Sc. Indo-Nederl., vi; New Guinea, 20.

Number of laminæ in the disk 13–14. D. 21. A. 21. The length of the disk is contained 3¼ to 3⅕ times in the total length; the width between the pectorals is contained 5⅓ to 5$\frac{1}{10}$ times in the same. The angle of the mouth is situated in the vertical from the third lamina of the disk. The length of ventral fin equals the distance between the root of the pectoral and the posterior margin of the eye.

Lengths 7.40; 5.10 inches.

Locality: Bay of La Paz, Lower California.

ENGRAULIDIDÆ.

ENGRAULIS RINGENS, *Jenyns* [No. 12965].

Engraulis ringens, JENYNS, Voy. Beagle, Fish., 1842, 136.—CUV. & VAL., Hist. Nat. des Poiss., xxi, 1848, 27.—GÜNTHER, Cat. Fishes, vii, 1868, 386.

Engraulis mordax, GIRARD, Proc. Acad. Nat. Sci. Phila., 1854, 138, 154; P. R. R. Rep. x, Fishes, 1858, 334

Engraulis pulchellus, GIRARD, Proc. Acad. Nat. Sci. Phila., 1854, 199; U. S. Naval Astron. Exped., Zoöl., Fishes, 247, pl. 31, f. 5–9.

Engraulis nasus, KNER & STEINDACHNER, Sitzb. d. k. Ak. Wiss. Wien, liv, 1866, 388, f. 17.

Locality: Mare Island, California.

SILURIDÆ.

ÆLURICHTHYS PANAMENSIS, *Gill* [Nos. 17548, 17549].

Ælurichthys panamensis, GILL, Proc. Acad. Nat. Sci. Phila., 1863, 172.—GÜNTHER, Cat. Fishes, v, 1864, 179; Trans. Zoöl. Soc. London, vi, 1869, 476.—STEINDACHNER, Sitzb. d. k. Akad. d. Wiss. Wien, lxxii, 1875, Ichthyologische Beiträge, iv, 14.

Ælurichthys nuchalis, GÜNTHER, Trans. Zoöl. Soc. London, vi, 1869, 476, pl. 81, f. 2; Cat. Fish., v, 1864, 179.

Locality: Pacific coast of Lower California; a special locality, Boca Solidad.

OPHICHTHYIDÆ.

OPHICHTHYS TRISERIALIS, (*Kaup*) *Gthr.* [No. 17542].

Ophichthys triserialis, GÜNTHER, Cat. Fishes, viii, 1870, 58.

Murænopsis triserialis, KAUP., Apod. Fish., 1856, 12.

Herpetoichthys collisoma, ABBOTT, Proc. Acad. Nat. Sci. Phila., 1860, 475.

Ophisurus californiensis, GARRETT, Proc. Calif. Acad. Nat. Sci., iii, 1867, 66.

Locality: Lower California.

Günther states that there are one or two series of smaller brown spots along the abdomen. We obtained two specimens of this fish, and neither shows any brown spots on the abdomen. In every other respect they agree with Abbott's description.

RHINOBATIDÆ.

RHINOBATUS PRODUCTUS, *Ayres* [No. 18352].

Rhinobatus productus (AYRES, MSS.), GIRARD, Proc. Acad. Nat. Sci. Phila., 1854, 196; U. S. P. R. R. Rep., x, 1858, part iv, 370.

Rhinobatus leucorhynchus, GÜNTHER, Proc. Zoöl. Soc. London, 1866, 604; Trans. Zoöl. Soc. London, 1868, 490; Cat. Fish., viii, 1870, 444 (fig. of snout).

Female.—The anterior nasal valve is dilated into a very narrow lateral fold, scarcely projecting beyond the nasal margin. The length of the nostril is slightly more than its distance from the lateral margin of the head, and more than the distance between the inner angles of the nostrils, and much less than the width of the mouth, which is very slightly arched. Snout produced, the distance between the outer angles of the nostrils being three-fifths of that between the mouth and the end of the snout. A series of small, depressed, polished spines along the median ridge of the back; groups of small polished tubercles on the orbital margin and on the shoulder. A broad groove between the rostral ridges, which are separated along their entire length. Snout lighter colored than the rest of the body.

Length, 50 inches.

Locality: St. Bartholomé Bay, Lower California.

We have examined Girard's type in the National Museum, and have determined it to be identical with *leucorhynchus* of Günther. The "blackish band along the middle of the back, with diffused blotches upon the sides and a double band of the same color along the middle of the snout" are not discernible. The coloration is uniform, except the light-colored snout.

II.—*Fishes of the Hawaiian Group.*

TETRODONTIDÆ.

TETRODON IMPLUTUS, *Jenyns* [No. 17997].

Tetrodon implutus, JENYNS, Voy. Beagle, Fish., 1842, 152.

Tetraodon laterna, RICHARDSON, Voy. Sulphur, Zoöl., 1844, 124, pl. 61, f. 2; Rep. Ichth. Chin., Rep. 15th Meet. Brit. Assoc., 1846, 199.—BLEEKER, Verh. Bat. Gen., xxiv, 1852, Blootk. vissch., 23; Nat. Tyds. Ned. Ind., iii, 1852, Bydrage Ichth. Moluksch. eil., 299.—GÜNTHER, Fish. Zanz., 1866, p. 131.

Arothron laterna, BLEEKER, Enum. Pisc. Arch. Ind., 1859, 200.

Crayracion implutus, BLEEKER, Atl. Ichth., 1865, *Gymnod.*, p. 71.

Crayracion laterna, BLEEKER, Atl. Ichth., 1865, pl. 205, *Gymnod.*, pl. 1, f. 3.

Tetrodon hispidus, GÜNTHER, Cat. Fish., viii, 1870, 297 (in part—var. *β*, 298).

Locality: Honolulu Harbor, Oahu.

Specimens small, under surface of the body densely covered with short spines; the longitudinal lines on the abdomen distinct, and the round, bluish-white spots on the dorsal region are few in number. Specimens of this fish from the Fanning group show some slight differences, which will be pointed out in the account of the collection from that locality.

BALISTIDÆ.

BALISTES BUNIVA, (*Lacép.*) *Gthr.* [No. 18001].

Balistes ringens, OSBECK, Voy. Chin., ii, 1771, 93.—BLOCH., Ausl. Fisch., 1785, pl. 152, f. 2.—BLOCH., Syst. Ichth., ed. SCHN., 1801, 472.—LACÉP., Hist. des Poiss., i, 1798, 370, pl. 18, f. 1.—RICHARDSON, Voy. Samar., Fish., 1848, 21, pl. 16, f. 1–4; Rep. Ichth. Chin., Rep. 15th Meet. Brit. Assoc. 1846, 201.—HOLLARD, Ann. Sc. Nat., 4th series, 1854, Zoöl. i, 317.—BLEEKER, Act. Soc. Sc. Ind. Néerl., viii, 1860; Sumatra, viii, 69 (nec Linn.).

Baliste bunica, LACÉP., op. cit., v, 1803, 669, pl. 21, f. 1.

Balistes piceus, POEY, Proc. Acad. Nat. Sci. Phila., 1863, 180; Repert. Fis.-Nat., Cuba, ii, 1868, 435.

Melichthys ringens, BLEEKER, Atl. Ichth., v, 1865, 108, pl. 220, f. 2; *Balist.*, pl. vi, f. 2.

Balistes niger, GÜNTHER, Fish. Zanz., 1866, 135, pl. 19, f. 1.

Balistes bunira, GÜNTHER, Cat. Fish., viii, 1870, 227.

Locality: Honolulu, Oahu.

BALISTES VIDUA, *Richards.* [No. 17984].

Balistes vidua, RICHARDSON, Voy. Sulphur, Fish., 1844, 128, pl. 59, f. 9-10.—BLEEKER, Nat. Tyds. Ned. Ind., iii, 1852, Amboina, ii, 565.—HOLLARD, Ann. Sc. Nat., 1854, 4th series, Zoöl. i, 319.—GÜNTHER, Cat. Fish., viii, 1870, 216.

Melichthys vidua, BLEEKER, Atl. Ichth., v. 1865, 109, pl. 217, f. 2; *Balist.*, pl. iii. f. 2.

Locality: Honolulu Harbor, Oahu.

PLEURONECTIDÆ.

RHOMBOIDICHTHYS PANTHERINUS, (*Rüpp.*) *Gthr.*, 1798, [Nos. 17979, 17981].

Rhombus pantherinus, RÜPPELL, Atl. Fisch., 1828, 121, pl. 31, f. 1.—BLEEKER, Nat. Tyds. Ned. Ind., viii, 1855, Kokos-eil., iii, 178.

Rhombus paroimanus, BENNETT, Proc. Comm. Zoöl. Soc., i, 168.

Rhombus sumatranus, BLEEKER, Verh. Bat. Gen., xxi, 1852, *Pleuron.*, 14.

Rhomboidichthys pantherinus, GÜNTHER, Cat. Fish., iv, 1862, 436.—KLUNZ., Verh. z.-b. Ges. Wien, xxi, 1871, 571.

Locality: Honolulu Harbor, Oahu. Very abundant.

GOBIIDÆ.

CULIUS FUSCUS, (*Bl.*) *Bleek.* [No. 18000].

Pœcilia fusca, BLOCH., Syst. Ichth., ed. SCHN., 1801, 453.

Cobitis pacifica, FORSTER, Descr. Anim., ed. LICHT., 1844, 235.

Cheilodipterus culius, BUCHANAN HAMILTON, Fish. Ganges, 1822, 55, pl. 5, f. 16.

Eleotris nigra, QUOY & GAIM., Voy. Freyc. Zoöl., 1824, 259, pl. 60, f. 2.—CUV. & VAL., Hist. Nat. des Poiss., xii, 1837, 233.—BLEEKER, Verh. Bat. Gen., xxv, 1853, Nalezing. Ichth. Beng., 105, pl. 1, f. 3.

Eleotris mauritianus, BENNETT, Proc. Comm. Zoöl. Soc., i, 166.

Eleotris brachyurus, BLEEKER, Verh. Bat. Gen., xxii, 1849, *Blenn. en Gob.*, 20; Enum. Spec. Pisc. Arch. Ind., 1859, 114.

Eleotris melanurus, BLEEKER, Verh. Bat. Gen., xxii, 1849, *Blenn. en Gob.*, 21.

Eleotris pseudacanthopomus, BLEEKER, Nat. Tyds. Ned. Ind., iv, 1853, Sumatra, ii, 276.

Culius niger, BLEEKER, Nat. Tyds. Ned. Ind., xi, 1856, Bœrœ, 411.

Eleotris fusca, GÜNTHER, Cat. Fish., iii, 1861, 125.—DAY, Proc. Zoöl., Soc., London, 1869, 517.

Eleotris incerta, BLYTH., J. A. S., of Bengal, 1860, 146.—DAY, Proc. Zoöl. Soc. London 1869, 517.

Eleotris soaresi, PLAYFAIR, Fish. Zanz., 1866, 74. pl. 9, f. 4.

. *Culius fuscus* BLEEKER, Arch. Néerland., ix, 1874, 303; x, 1875, 105.

Locality: Fresh-water streams of Oahu.

BRACHYELEOTRIS CYANOSTIGMA, *Bleek.* [No. 15395].

Eleotris cyanostigma, BLEEKER, Nat. Tyds. Ned. Ind., viii, 1855, Kokos-eil., iv, 452.—GÜNTHER, Cat. Fish., iii 1861, 119.—PLAYFAIR, Proc. Zoöl. Soc. London, 1867, 862.

Eleotriodes cyanostigma, BLEEKER, Enum. Spec. Pisc. Arch. Ind., 1859, 112.

Brachyeleotris cyanostigma, BLEEKER, Arch. Néerland., ix, 1874, 306; x, 1875, 106.

D. $6\frac{1}{11}$. A. 10. L. lat. 25. L. trans. 8–9.

Height of the body equals the length of the head, and is slightly more than one-fifth of the total length; eye not quite one-third of the length of the head, and slightly longer than the snout; the jaws equal anteriorly, and the end of the superior extends beyond the vertical from the anterior margin of the orbit. Teeth in a villiform band; an external series of longer ones; a lateral canine tooth on each side of the lower jaw, hooked backward. Præoperculum armed at the angle with a group of four small spines, coalescing by their bases. Scales ctenoid. Head covered with large scales; snout, interorbital space and maxillaries naked. The third dorsal spine produced into a filament; posterior rays of soft dorsal and anal prolonged back to the base of the caudal fin. The base of the anal ends before the termination of the dorsal, but its last rays are longer, and extend as far back as those of the dorsal. Ventrals commence under the base of the pectorals, and extend to the commencement of the anal. Pectorals slightly longer than the ventrals. Six blackish spots or bands along the sides of the body; each scale with a blue spot (white in alcohol); fins minutely dotted.

Lengths, 1.50, 1.15 inches.

Locality: Coral reefs of Oahu.

In 1862 Prof. T. Gill* made the interesting discovery that the young of the Carangoids and Scombroids have the præoperculum armed with spines, which afterward become absorbed into the substance of the bone. We have been mainly guided by this analogy in the identification of our species, which agrees perfectly well in every other particular with *cyanostigma*. The specimens, as may be seen, are quite small, and the spines have more of the appearance of excrescences than of permanent armatures.

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* Proc. Acad. Nat. Sci. Phila., 1862, 262, 328, 440.

SICYOPTERUS STIMPSONI, (*Gill*) *Bleek.* [No. 17991].

Sicydium (Sicyopterus) stimpsoni, GILL, Proc. Acad. Nat. Sci. Phila., 1860, 101.
Sicydium stimpsoni, GÜNTHER, Cat. Fish., iii, 1861, 93.
Sicyopterus stimpsoni, Bleeker, Arch. Néerland., ix, 1874, 313.

Locality: Fresh-water streams of Oahu.

AWAOUS CRASSILABRIS, (*Gthr.*) *Streets* [Nos. 17974, 17996].

Gobius crassilabris, GÜNTHER, Cat. Fish., iii, 1861, 63.

Locality: Fresh-water streams of Oahu.

There is a marked difference between the sexes of this species, as there is probably in other species of *Gobiidæ*. Professor Gill first suggested to us this probable difference, and our dissections confirmed his suggestion.

In the males the anal papilla is triangular, with a prolonged and slender apex; while in the females it is short, broadly quadrilateral, and the free margin fringed, and sometimes emarginate. The difference extends to the head also. In males it is broad, rounded in front, and the upper profile of the snout is slightly inclined downward, as in the typical *Gobius;* the lips are thick, and the end of the superior maxillary bone extends to or beyond the vertical from the center of the eye. The head of a female is narrower, more pointed in front, the lips less turned, and the end of the upper maxillary is anterior to the vertical from the center of the eye. In one specimen, a young male, we failed to find any evidence of testicles. In this the anal papilla was similar to those of the other male specimens, while the general features of the head were those of a female. In Günther's description these differences are for the most part confounded, and it would be impossible to identify the species from one sex only, but if both are at hand they conform to it in every particular.

ACENTROGOBIUS OPHTHALMOTÆNIA, (*Bleek.*) *Streets* [No. 15399].

Gobius ophthalmotænia, **Bleeker**, Nat. Tyds. Ned. Ind., vii, 1854, Kokos-eil., i, 46.—**Günther**, Cat. Fish., iii, 1861, 37.

Gobius capistratus, **Peters**, Arch. f. Naturg., 1855, pt. i, 251.—**Günther**, op. cit., iii, 1861, 36.—**Klunzinger**, Verh. z.-b. Ges. Wien, 1871, 476.

D. $6\frac{1}{11}$. A. $\frac{1}{10}$. L. lat. 27. L. trans. 8–9.

The height of the body is contained from 5 to $5\frac{2}{3}$ times in the total length, including the caudal fin; without the caudal it is from 4 to $4\frac{1}{2}$; the length of the head is contained from 4 to $4\frac{1}{4}$ times in the total length, including caudal; without caudal, from $3\frac{1}{3}$ to $3\frac{1}{2}$ times. Head convex above, nearly as broad as high, the width is contained about $1\frac{1}{2}$ times in the length, and the height about $1\frac{1}{3}$ times in the same; the diameter of the eye is one-fourth of the length of the head; interorbital space narrow; length of the snout about equals the diameter of the eye, obtuse; upper and lower jaws subequal in front; the end of the upper extends to under the anterior portion of the eye; cleft of the mouth slightly oblique. Teeth in the jaws in several series, an external series of enlarged teeth; in the lower jaw on either side a canine tooth, hooked backward. Neck and crown of head, cheeks, and opercles scaly. Scales on the body ctenoid. Dorsal fins not continuous, the spinous portion lower than the soft, which is as high as the body; spinous more than one-half as long as the soft. Upper pectoral rays silky in smaller specimens only; caudal rounded, as long as the head. Greenish, with five broad, brown streaks along the back, and five others, smaller and resembling spots in the smaller specimens, alternating with the upper along the middle line of the body; small spots scattered over the sides of the body; head minutely punctate, some larger, and in alcohol white, spots on the cheeks; a dark vertical band passing through the center of the eye to the inferior border of the præoperculum; a short, oblique band on the operculum; dorsal and caudal fins brown spotted; the other fins minutely dotted with brown.

Lengths, 1.70, 1.50, 1.35, 1.25.

Locality: Coral reefs of Oahu.

GLOSSOGOBIUS GIURIS, (*Buch. Ham.*) *Streets* [No. 17995].

Gobius giuris, **Buchanan Hamilton**, Fish. Ganges, 1822, 51, pl. 33, f. 15.—**Cuv. & Val.**, Hist. Nat. des Poiss., xii, 1837, 72.—**Bleeker**, Verh. Bat. Gen., xxii, 1849, *Blenn. en Gob.*, 24.—**Günther**, Cat. Fish., iii, 1861, 21.

Gobius kokius, Cuv. & Val., op. cit., xii, 1837, 68.—Jerdon, Madr. Jour., xv, 148.—Bleeker, Verh. Bat. Gen., xxii, 1849, *Blenn. en Gob.*, 24.—Cantor, Catal., 180.—Jacq., Voy. Ind. Poiss., 1835, pl. 14, f. 3.

Gobius russelii, Cuv. & Val., op. cit., xii, 1837, 75.

Gobius catebus, Cuv. & Val., op. cit., xii, 1837, 76.

Gobius kora, Cuv. & Val., op. cit., xii, 1837, 77.

Gobius celebicus, Cuv. & Val., op. cit., xii, 1837, 74.—Bleeker, Nat. Tyds. Ned. Ind., vii, 1854, Banten, 318.

Gobius kurpah, Sykes, Trans. Zoöl. Soc. London, ii, 1841, 352, pl. 61, f. 1.

Gobius platycephalus, Peters, Monatsber. Berl. Acad., 1852, 681.

Gobius phaiosoma, Bleeker, op. cit., xxii, 1849, *Blenn. en Gob.*, 30; Nat. Tyds. Ned. Ind., 1851, i, f. 5.

Gobius fusiformis, Bleeker, op. cit., xxii, 1849, *Blenn. en Gob.*. 30.

Gobius fasciato-punctatus, Richardson, Voy. Sulph. Ichth., 1844, 145, pl. 62, f. 13, 14.

D. $6\frac{1}{9}$. A. $\frac{1}{8}$. L. lat. 33.

Ten longitudinal series of scales between the second dorsal and anal fins. Height of the body is one-sixth or one-seventh of the total length, and the length of the head is one-quarter of the same. Head depressed, broader than long, the breadth is four-fifths of the length, and the height is three-fifths of the same. The diameter of the eye is contained $3\frac{1}{2}$ or 4 times in the length of the head. Interorbital space flat, proportionately broader in larger specimens than in smaller ones; in the former it nearly equals the vertical diameter of the eye. Snout depressed, length equals the diameter of the eye, upper profile obliquely descending; cleft of the mouth nearly horizontal; lower jaw prominent; the end of the upper extends to the vertical from the center of the eye. Teeth in a villiform band; an external enlarged series; no prominent canines. Upper surface and sides of the head naked; scales on the neck much smaller than those on the sides of the body; they extend nearly as far forward on the occiput as a line from the posterior border of the præoperculum. Second dorsal fin higher than the first, and nearly as high as the body; the distance of the first dorsal from the eye equals that of the snout from the posterior margin of the præoperculum. Ventrals extend nearly to the vent; pectorals somewhat longer. Caudal rounded, shorter than the head. Yellowish-brown, with five or six broad brown bands across the back; the color of these bands sometimes rather faint, and their outlines indistinct. Along the sides of the body, and alternating with the dorsal bands, is a series of rounded deep brown blotches. Under the lens all the coloration on the sides is resolved into minute dots; head dotted. A small brown spot on the middle of the operculum; another behind the eye, and sometimes there is one present on the upper part of the base of the pectoral. Fins minutely dotted, on the dorsal and caudal fins the dots are aggregated, and arranged in lines. No cross-streak between the eyes.

Lengths, 2.10, 1.40, 1.40 inches.

Locality: Coral reefs of Oahu.

SCORPÆNIDÆ.

SEBASTAPISTES STRONGIA,* (*Cuv. & Val.*) [No. 15400].

Scorpæna strongia, CUV. & VAL., Hist. Nat. des Poiss., iv, 1829, 323.—QUOY & GAIM., Voy. Astrol. Poiss., 1834, 688, pl. 11, f. 2.—LESSON, Voy. Coquil. Poiss., 1830, 213.—GÜNTHER, Jour. Mus. Godeff., ii, 1873–'75, Fische der Sudsee, i, 80 (not of Cat. Fish., ii, 1860, p. 105).

D. $11\frac{1}{9}$. A. $\frac{3}{5}$. L. lat. 45–47.

Teeth on the vomer and palatine bones; those on the latter in a narrow band.

Height of the body is contained $3\frac{1}{2}$ times in the total length, and the length of the head 3 times in the same. Interorbital space one-half the diameter of the eye; and the latter is contained three times in the length of the head. Snout as long as the diameter of the eye; jaws subequal in front; no skinny flaps. The end of the upper maxillary extends to the vertical from the center of the eye. Interorbital space deeply concave, a longitudinal ridge on either side of the bottom of the groove; three spines on the superior orbital ridge, and three on either side of the occiput; space between the latter flat; three small spines on the upper posterior orbital border; a group of three or four on the tempero-scapular region; two flat spines on the operculum, the upper of which is the larger; a large flat spine above the base of the pectoral fin; four or five on the posterior border of the præoperculum, the upper the largest. A series of short ridges, some of them ending posteriorly in spines, below the eye; springing from the inner side of the anterior nostrils are two short spines directed upward and backward, and two short ridges running from their bases bridge the short concavity behind; on the middle of the snout are two low ridges, diverging anteriorly. Præorbital spines conspicuous; two, larger than the rest, diverge from a common base; the posterior and larger is directed downward across the superior maxillary bone; the other is directed inward close to the body of the bone; above the base of the posterior is another directed backward; the surface of the præorbital irregularly ridged; some of the ridges ending in spines; rudimentary scales on sides of the head. The spinous portion of the dorsal fin higher than the soft. The third and fourth spines are the longest, shorter than the second anal, and nearly one-half the length of the head; second anal longer than the third, stout and striated. Whitish, clouded and spotted with dark brown, and dotted all over with minute dark brown dots. The brown spots on the head are separated by bluish-white lines.

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* The genus SEBASTAPISTES is proposed by Prof. Gill for the reception of the *Scorpæna guttata*, Girard, *Scorpæna strongia*, Cuv. & Val., and *Sebastichthys cyanostigma*, Bleeker, which are segregated, in the words of Gill, "from their allies by the naked crown and jaws, the spinous armature of the inferior margin of the præorbital, the procurrent bases of the pectoral fins, &c. The genus is intermediate between the Sebastoid and Scorpænoid genera, and nearly related to *Parascorpæna*, Blkr."

Total length, 2.60 inches.

Locality: Honolulu, Oahu.

LABRIDÆ.

PSEUDOCHEILINUS HEXATÆNIA, *Bleek.* [No. 17989].

Cheilinus hexatænia, BLEEKER, Act. Soc. Sc. Indo.-Nederl., ii, 1857, Amboina, viii, 84.

Pseudocheilinus hexatænia, BLEEKER, Atl. Ichth., i, 1862, *Labr.* 73, pl. 23, f. 2.—GÜNTHER, Cat. Fish., iv, 1862, p. 134.—KLUNZINGER, Verh. z.-b. Ges. Wien, 1871, 537.

Pseudocheilinus psittaculus, KNER & STEINDACHNER, Sitz. d. k. Ak. Wiss. Wein, liv, 1866, 376, f. 7.

D. $\frac{9}{12}$. A. $\frac{3}{10}$. P. $\frac{2}{12}$. L. lat. 24. L. trans. $\frac{2}{6}$.

The height of the body equals the length of the head, and is contained $3\frac{1}{2}$ times in the total length; head longer than high, with the upper profile slightly concave, vertex convex; the diameter of the eye is one-fifth of the length of the head; the snout about one-third the length of the head; interorbital space equals the diameter of the eye; jaws equal anteriorly; chin not prominent; the end of the upper maxillary bone does not extend to the vertical from the anterior border of the orbit; its length is contained 3 times in the length of the head. Teeth in a single series; six canines in the upper jaw anteriorly, the posterior pair much larger than the others, and bent outward and backward; two canines in the lower jaw anteriorly; no posterior canines. Three series of large scales on the cheeks, the lower series covering the limb of the præoperculum; præoperculum subrectangular, posterior border entire, membranous, angle obtusely rounded; operculum scaly. A row of elongated scales on each side of the vertical fins, forming sheaths at their bases; two elongated scales between the ventrals. Lateral line interrupted; tubules simple. The soft portion of the dorsal fin higher than the spinous; spines subequal; second anal spine the longest; the posterior rays of the soft dorsal and anal prolonged. Pectorals rounded, seven times in the total length. Ventrals pointed; their length is contained 8⅔ times in the total length. Caudal rounded. Color (in alcohol) olive-green, diluted inferiorly, with seven blackish, longitudinal bands, which increase slightly in breadth posteriorly; the four upper bands commence above the level of the inferior border of the orbit; the two following begin in the axillary space; the lowest indistinct. Five of the bands are continued on the caudal peduncle; the upper and lower cease opposite the termination of the dorsal and anal fins. A narrow white line on the middle of the snout, extending from between the eyes to the extremity of the snout. Short linear spots on the dorsal fin; the rays and spines green. No ocellus on the upper part of the base of the caudal, or anywhere on the caudal peduncle.

Total length, 4.20 inches.

Locality: Honolulu, Oahu.

This fish is so characteristic that we do not hesitate to pronounce it *hexatænia*, although there are a great many discrepancies between the above description and those given by Bleeker and others. We find three series of scales on the cheeks, instead of two, and six canine teeth in the upper jaw, instead of eight, as is given by Bleeker. Kner and Steindachner found the hinder border of the præoperculum finely serrated, while in our specimen it is entire and membranous. According to Bleeker the diameter of the eye is one-third of the length of the head, and the length of the superior maxilla one-fourth of the same; the pectorals 5⅔ in the total length, and the ventrals six times in the same. We find a discrepancy between the text of this author and the measurements of his figure. The latter accord more nearly with our own measurements. In the present specimen there is no evidence of the ocellus at the base of the caudal, which all other writers have observed.

STETHOJULIS AXILLARIS, (*Q. & G.*) *Bleeker* [No. 15394].

Julis axillaris, QUOY & GAIM., Voy. Uran. Zoöl. Poiss., 1824, 272.—CUV. & VAL., Hist. Nat. des Poiss., xiii, 1839, 472.

Julis (Halichoeres) bandanensis, BLEEKER, Nat. Tyds. Ned. Ind., ii, 1851, Banda, i, 254.

Stethojulis axillaris, BLEEKER, Atl. Ichth., i, 1862, *Labr.*, 136, pl. 44. f. 7.—GÜNTHER, Cat. Fish., iv, 1862, 142.—KLUNZINGER, Verh. zoöl.-bot. Gesells. Wien, xxi, 1871, 541.

D. $\frac{9}{11}$. A. $\frac{2}{11}$. P. $\frac{2}{12}$. L. lat. 27. L. trans. $\frac{2}{9}$.

We have examined seven specimens from this locality, and not one of them showed more than two spinous rays in the anal fin. This is interesting, from the fact that all the authorities whom we have consulted give three spines to this fin.

Locality: Honolulu, Oahu.

CHEILIO INERMIS, (*Forsk.*) *Richards.* [No. 17977].

Labrus inermis, FORSKAL, Descr. Anim., 1775, 34.—BLOCH, Syst. Ichth., ed. SCHN., 1801, 262.

Labrus hassek, LACÉP., Hist. des Poiss., iii, 1803, 513.

Cheilio auratus (COMMERS.), LACÉP., op. cit., iv, 1803, 433.—QUOY & GAIM., Voy. Uran. Zoöl., 1824, 274, pl. 54, f. 2.—CUV. & VAL., Hist. Nat. des Poiss., xiii, 1839, 341.—BLEEKER, Nat. Tyds. Ned. Ind., ii, 1851, Celebes, i, 221.

Cheilio fuscus (COMMERS.), LACÉP., Hist. des Poiss., iv, 1803, 433.—CUV. & VAL., op. cit., xiii, 1839, 349.

Labrus fusiformis, RÜPPELL, N. W. Fische, 1837, 7, pl. 1, f. 4.

Cheilio cyanochloris, CUV. & VAL., op. cit., xiii, 1839, 346, pl. 382.

Cheilio forskalii, CUV. & VAL., op. cit., xiii, 1839, 349.

Cheilio hemichrysos, CUV. & VAL., op. cit., xiii, 1839, 351.—BLEEKER, Nat. Tyds. Ned. Ind., ii, 1851, Banda, i, 255.

Cheilio viridis, CUV. & VAL., op. cit., xiii, 1839, 352.

Cheilio microstoma, CUV. & VAL., op. cit., xiii, 1839, 353.

Cheilio ramosus, JENYNS, Zoöl. Beagle, Fish., 1842, 102.

Chilio auratus, PETERS, Monatsb. Preuss. Ak. Wiss., 1855, 453.

Chilio bicolor, BIANC., Menn Ac. So. Bologn., viii, 1859, Spec. Zoöl. Mosamb., 46, pl. 25.

Cheilio inermis, RICHARDSON, Rep. Ichth. Chin. Jap., Rep. 15th Meet. Brit. Assoc., 1846, 258.—BLEEKER, Atl. Ichth., i, 1862, *Labr.*, 82, pl. 31, f. 4.—GÜNTHER, Cat. Fish., iv, 1862, 194.

Chilio inermis, KLUNZINGER, Verhn. zoöl.-bot. Gesells. Wien, xxi, 1871, 530.

Five specimens gave the following formula for the dorsal and anal fins:

D $\frac{9}{13}$. A $\frac{3}{11}$.

Locality: Honolulu, Oahu.

? JULIS MELANOPTERA, *Gthr.* [No. 15401].

Julis melanoptera, GÜNTHER, Cat. Fish., iv, 1862, 183.

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. lat. 27. L. trans. $\frac{2\frac{1}{2}}{9}$.

The height of the body is slightly more than the length of the head, and one-fourth of the total length (the caudal lobes not included). The diameter of the eye is two-ninths of the length of the head, and one and a half times in the length of the snout. No posterior canine teeth; two anterior canine teeth of the lower jaw are received between the two of the upper. Dorsal spines pungent, shorter than the rays; caudal lobes produced; ventrals pointed, not prolonged, and are five-sevenths of the length of the pectorals; the latter shorter than the head—seven-ninths of its length. A few scales on the supraopercular region. Colors in alcohol:—head uniform dark purplish, without any marking; body brownish-olive; dorsal and anal fins dark violet, the former with a black spot anteriorly between the first and fourth spines; pectoral with an oblique oblong black spot, and a black spot above on the base of the fin.

Locality: Honolulu, Oahu.

The only point about this description which renders the identification anyways doubtful is the absence of the "broad, lighter, transverse band below the second to the sixth dorsal spines, extending to the belly;" the colors are somewhat faded, which, probably, accounts for its absence. There is no habitat assigned to the species by Günther, but he gives Ceylon as a probable locality.

POMACENTRIDÆ.

GLYPHIDODON SAXATILIS, (*Linn.*) *Gthr.* [No. 15393].

Chætodon saxatilis, LINN., Syst. Nat., i, 1766, 466.—FORSK., Descr. Anim., 1775, 62.—BLOCH, Ichth., vi, 1787, 71, pl. 206, f. 2.

Chætodon marginatus, BLOCH, op. cit., vi, 1787, pl. 207.—LACÉP., Hist. des Poiss., iv, 1803, 451, 463.

Chætodon mauritii, BLOCH, op. cit., vi, 1787, pl. 213, f. 1.—BLOCH, Syst. Ichth., ed. SCHN., 1801, 234.—LACÉP., op. cit., iv, 1803, 452, 470.

Chætodon sargoides, LACÉP., op cit., iv, 1803, 453, 471, 472.

Labrus sexfasciatus, LACÉP., op. cit., iii, 1803, 477, pl 19, f. 2.

Chætodon tyrwhitti, BENNETT, Fish. of Ceylon, 1834, pl. 25.

Glyphisodon saxatilis, CUV. & VAL., Hist. Nat. des Poiss., v, 1830, 446.—RÜPPELL, Atl. Fische, 1828, 35; N. W. Fische, 1837, 126.

Glyphisodon rahti, CUV. & VAL., op. cit., v, 1830, 456; ix, 1833, 507.—BLEEKER, Nat. Tyds. Ned. Ind., iii, 1852, Amb. & Cer., 287.—RICHARDSON, Rep. Ichth. Chin., Rep. 15th Meet. Brit. Assoc., 1846, 253.

Glyphisodon cœlestinus (SOLAND.), CUV. & VAL., op. cit., v, 1830, 464; ix, 1833, 508.—RICHARDSON, op. cit., 1846, 253.—BLEEKER, Verh. Bat. Gen., xxi, 1846, *Labr. Cten.*, 15.

Glyphisodon tyrwhitti, RICHARDSON, op. cit., 1846, 253.

Glyphisodon quadrifasciatus, BLEEKER, Verh. Bat. Gen., xxi, 1846, *Labr. Cten.*, 17.

Glyphisodon waigiensis, BLEEKER, Verh. Bat. Gen., xxi, 1846, *Labr. Cten.*, 13.

Sparus fasciatus, GRONOOV., Syst. (1780), ed. GRAY, 1854, 60.

Glyphidodon saxatilis, GÜNTHER, Cat. Fish., iv, 1862, p. 35.—KLUNZINGER, Verhn. zoöl.-bot. Ges. Wien, xxi, 1871, 524.

Glyphidodon cœlestinus, GÜNTHER, Cat. Fish., iv, 1862, 38.

Locality: Honolulu, Oahu.

Our specimens from this locality agree more closely with Günther's description of *G. saxatilis*, than with that of *G. cœlestinus;* which, however, they should correspond with, if there were any real specific differences between them. We, therefore, do not hesitate to refer them both to one species, as has been done by Klunzinger.

ACANTHURIDÆ.

ACANTHURUS TRIOSTEGUS, var. SANDVICENSIS, *Streets.* [No. 15398].

Our collection from these islands does not contain a single specimen of the typical *triostegus.* We have twenty-three specimens, collected in the harbor of Honolulu, varying in length from 1.2 to 4.8 inches, and they present certain peculiarities in common which stamp them as a well-marked variety.

The band down the middle of the forehead to the extremity of the snout is absent. The second vertical line on the side of the body ceases, as in *triostegus*, in the axil of the pectoral fin; but, instead of there being but a small round black spot on the outer surface of the base of that fin, as in the typical examples, there commences, in the same situation, a line which passes obliquely downward and backward to near the ventral surface of the body. Finally, in *A. triostegus* there is a small black spot on either side of the caudal peduncle inferiorly and one superiorly; in our variety, the lower spots are invariably wanting. In every other respect the specimens correspond exactly to the description as given by Günther. These differences cannot depend upon age, for we have compared them with specimens of the same size from other localities, and find the peculiarities to hold good. Cuvier and Valenciennes only, of ichthyological writers, speak of the presence, sometimes, of a line on the breast—"Il y a quelquefois de chaque côté de la poitrine une ligne ou una série longitudinale de points bruns"—but it is not associated in their description with the absence of the other markings which we have mentioned.

Locality: Harbor of Honolulu, Oahu.

ACANTHURUS BLOCHI, *C. & V.* [Nos. 15397, 17973].

Acanthurus blochi, CUV. & VAL., Hist. Nat. des Poiss., x, 1835, 209.—GÜNTHER, Jour. Mus. Godeff., ii, 1873–'75, Fische der Sudsee, i, 109, pl. 69, f. B.

Acanthurus annularis, CUV. & VAL., op. cit., x, 1835, 209 (young).

Acanthurus xanthopterus, CANTOR, Mal. Fish., 209, f. 4 (nec C. & V).

Acanthurus matoides, GÜNTHER, Cat. Fish., iii, 1861, 330.—KLUNZINGER, Verh. zoöl.-bot. Gesel., xxi, 1871, Fisch. d. Roth. Meer, 508.

Locality: Harbor of Honolulu, Oahu.

NASEUS UNICORNIS, (*Forsk.*) *Gthr.* [No. 17976].

Chætodon unicornis, FORSK., Descr. Anim., 1775, 63.

Monoceros raii, BLOCH, Syst. Ichth., ed. SCHN., 1801, 181.

Monoceros biaculeatus, BLOCH, Syst. Ichth., ed. SCHN., 1801, 180, pl. 42.

Naseus fronticornis, CUV. & VAL., Hist. Nat. des Poiss., x, 1835, 259.—SCHLEG., Faun. Japon. Poiss., 1850, 129, pl. 69.

Harparus monoceros, FORSTER, Descr. anim., 1844, 219.

Naseus unicornis, GÜNTHER, Cat. Fish., iii, 1861, 348.—KLUNZINGER, Verh. zoöl.-bot. Ges., xxi, 1871, Fisch. d. Roth. Meer 512.—GÜNTHER, Jour. Mus. Godeff., ii, 1873–'75, Fische der Sudsee, i, 118, pl. 78.

Naseus olivaceus (SOLAND.), CUV. & VAL., op. cit., x, 1835, 288.—GÜNTHER, Cat. Fish, iii, 1861, 352 (young).

Locality: Honolulu, Oahu.

CARANGIDÆ.

TRACHUROPS MAURITIANUS, (*Q. & G.*) *Streets* [No. 17998].

Caranx mauritianus, QUOY & GAIM., Voy. Uran. Zool., 1824, 359.—CUV. & VAL., Hist. Nat. des Poiss., ix, 1833, 60.

Caranx macrophthalmus, RÜPPELL, Atl. Fisch., 1828, 97, pl. 25, f. 4.—KLUNZINGER, Verh. zoöl.-bot. Gesel., xxi, 1871, Fisch. d. Roth. Meer, 458 (nec Agass.).

Caranx crumenophthalmus, GÜNTHER, Cat. Fish., ii, 1860, 429 (in part); Jour. Mus. Godeff., pt. xi, 1876, Fische der Sudsee, pt. v, 131.

D. $8\frac{1}{25}$. A. $2\frac{1}{12}$. L. plates 36.

Teeth in the upper jaw in a narrow villiform band; those in the lower jaw even, in a single series; teeth on the vomer, palatines, and tongue.

Height of the body is contained 4¾ times in the total length, and the length of the head slightly more than 4 times in the same. The diameter of the eye is one-fourth of the length of the head, and equals the length of the snout, and interorbital space. Interorbital space elevated into a median crest. Lower jaw projecting beyond the upper; the end of the latter extends somewhat beyond the vertical from the anterior margin of the eye. Breast scaly; lateral line scarcely bent; scales becoming plate-like below the middle of the second dorsal fin. Pectoral slightly longer than the head. Opercular spot distinct.

Locality: Harbor of Honolulu, Oahu.

On comparing this species with indubitable specimens of *crumenophthalmus* from the Atlantic, we find the following characteristic differences. In the latter the eye is much larger—little over three times in the length of the head; the interorbital space is much more flattened; the end of the upper jaw extends further backward; and the pectoral fin is shorter—not equal to the head-length. A more important character, however, is in the shape of the interopercular bone. In *mauritianus* it is very obliquely rounded, and the triangular space of the isthmus is almost wholly exposed between the edges of the bones of the opposite sides; in the Atlantic fish, on the contrary, the interoperculum is nearly rectangular, and the inferior edges of the bones overlap along nearly the entire extent of the isthmus, leaving but a very small space of it uncovered at the angles, which are slightly rounded; there is also a broad, shallow notch on the posterior border of the bone. Cuvier and Valenciennes, in their diagnosis of the species, direct attention to this character, which seems to have been entirely overlooked by later ichthyologists.

C. hasselti, Gthr., is probably synonymous with this species.

CARANGUS MELAMPYGUS, (*C. & V.*) *Streets* [No. 17980].

Caranx melampygus, CUV. & VAL., Hist. Nat. des Poiss., ix, 1833, 116.—GÜNTHER, Cat. Fish., ii, 1860, 446; Jour. Mus. Godeff., 1876, pt. xi, Fische der Sudsee, pt. v. 133, pl. 86.

Caranx stellatus, EYD. & SOUL., Voy. Bonite, Poiss. 167, pl. iii, f. 2.—GÜNTHER, Cat. Fish., ii, 1860, 436.

Caranx bixanthopterus, RÜPP., N. W. Fische, 1837, 49, pl. 14, f. 2.—KLUNZINGER, Verh. zoöl.-bot. Ges., xxi, 1871, Fisch. d. Roth. Meer, 464.

D. $8\frac{1}{22\text{–}24}$. A. $2\frac{1}{19}$. L. plates 36.

The number of rays in the anal fin did not vary in the five specimens examined. The anterior, pointed portions of the second dorsal and anal blackish.

Locality: Harbor of Honolulu, Oahu.

CARANGUS CHRYSOS, (*Mitch.*) *Gill* [No. 17987].

Scomber carangus, BLOCH, Naturg. ausländ. Fische, 1785, 340.—BLOCH, Syst. Ichth., ed. SCHN., 1801, 28.

Scomber chrysos, MITCHELL, Trans. Lit. & Phil. Soc. New York, i, 1815, 424.

Caranx carangus, CUV. & VAL., Hist. Nat. des Poiss., ix, 1833, 91.—CUV., Règne Anim. Ill. Poiss., 1829–'30, pl. 57, f. 2.—GUICHEN., Poiss. ROMON DE LA SAGRA, Hist. Cuba, 111.—GÜNTHER, Cat. Fish., ii, 1860, 448.

Caranx chrysos, CUV. & VAL., op. cit., ix, 1833, 98 (*nec* DeKay, Gthr., *et al.*).

Caranx ekala, CUV. & VAL., op. cit., ix, 1833, 117.

Caranx xanthopygus, CUV. & VAL., op. cit., ix, 1833, 109.

Carangus esculentus, GIRARD, U. S. & Mex. Bound. Surv., 23, pl. xi, f. 1–3.

Carangus chrysos, GILL, Proc. Acad. Nat. Sci. Phila., 1862, 434.

D. $8\frac{1}{20-22}$. A. $2\frac{1}{17-18}$. Lat. plates 31.

Height of body contained 4 times in the total length, and length of head 3 times in the same. Breast naked. Lower jaw has larger teeth intermixed with the others; end of the upper jaw extends beyond the vertical from the center of the eye. An opercular spot; margin and point of second dorsal fin blackish; anal yellow.

Length 4.80.

Locality: Honolulu, Oahu.

CHORINEMUS SANCTI PETRI, *Cuv. & Val.* [No. 17992].

Chorinemus sancti petri, CUV. & VAL., Hist. Nat. des Poiss., viii, 1831, 379, pl. 236.—GÜNTHER, Cat. Fish., ii, 1860, 473; Jour. Mus. Godeff., 1876, pt. xi, Fische der Sudsee, pt. v, 138.—BLEEKER, Verh. Bat. Gen., xxiv, 1852, Makr., 45. —PETERS, Arch. fur Naturg., 1855, pt. i, 245.

Chorinemus toloo, CUV. & VAL., op. cit., viii, 1831, 377.—GÜNTHER, Cat. Fish., ii, 1860, 473.—KLUNZINGER, Verh. zoöl.-bot. Ges., xxi, 1871, Fisch. d. Roth. Meer, 447.

Chorinemus moadetta, CUV. & VAL., op. cit., viii, 1831, 382.—KLUNZINGER, Verh. zoöl.-bot. Ges., xxi, 1871, Fisch. d. Roth. Meer, 448.

Chorinemus mauritianus, CUV. & VAL., op. cit., viii, 1831, 382.

Chorinemus tol, KNER, Novara Exped. Fisch., 1866, 162.

D. $7\frac{1}{20}$. A. $2\frac{1}{18}$.

Immature specimens. Height of body and length of head nearly equal, and almost one-fifth of the total. Length of snout somewhat more than the diameter of the eye; upper jaw extends beyond the vertical from the center of the eye. Spots on the sides of the body absent. Top of second dorsal black.

Locality: Honolulu, Oahu.

MULLIDÆ.

UPENEUS TRIFASCIATUS, (*Lacép.*) *Cuv. & Val.* [No. 17990].

Mullus trifasciatus, LACÉP., Hist. des Poiss., iii, 1803, 494, pl. 15, f. 1.

Mullus multifasciatus, QUOY & GAIM., Voy. Freyc. Poiss., 1824, pl. 59, f. 1.

Upeneus trifasciatus, CUV. & VAL., Hist. Nat. des Poiss., iii, 1829, 468.—JENYNS, Zoöl. Beagle, Fishes, 1842, 25.—BLEEKER, Nat. Tyds. Ned. Ind., ii, 1851, Banda, i, 237.—GÜNTHER, Cat. Fish., i, 1859, 407; Jour. Mus. Godeff., ii, 1873–'75, Fische der Sudsee, i, 59, pl. 44, f. B.-C.

Locality: Harbor of Honolulu, Oahu.

Two specimens. Both having a black spot behind the eye, as in *U. bifasciatus*; the color on the other parts of the body arranged as in *U. trifasciatus*.

UPENEOIDES VITTATUS, (*Forsk.*) *Bleek.* [No. 17999].

Mullus vittatus, FORSKAL, Faun. Arab., 31.—BLOCH, Syst. Ichth., ed. SCHN., 1801, 79.—LACÉP., Hist. des Poiss., iii, 1803, 382, 401, pl. 14, f. 1.—SHAW, Zoöl., iv, 1803, 616, pl. 89.

Mullus bandi, SHAW, op. cit., iv, 1803, 615.

Upeneus vittatus, CUV. & VAL., Hist. Nat. des Poiss., iii, 1829, 448.

Upeneus bivittatus, CUV. & VAL., op. cit., vii, 1831, 520.

Upeneus bitæniatus, BENNETT, Proc. Comm. Zoöl. Soc., 1830–'31, 59.

Upeneoides bivittatus, BLEEKER, Verh. Bat. Gen., xxii, 1849, *Perc.*, 64; Nat. Tyds. Ned. Ind., viii, 1855, Amboina, vi, 411.—DAY, Proc. Zoöl. Soc. London, 1867, 702.

Upeneoides vittatus, BLEEKER, Act. Soc. Reg. Sc. Ind. Neérl., ii, 1857, Amboina, 43.—GÜNTHER, Cat. Fish., i, 1859, 397; Jour. Mus. Godeff., ii, 1873–'75, Fische der Sudsee, i, 55.

Locality: Harbor of Honolulu, Oahu.

The oblique black bands on the lower caudal lobe are broader than those on the upper lobe.

SERRANIDÆ.

MORONOPSIS MARGINATUS, (*C. & V.*) *Gill.* [No. 17993].

Dules marginatus, CUV. & VAL., Hist. Nat. des Poiss., iii, 1829, 116, pl. 52.—HOMBRON et JAQUINOT, Dumont D'Urville, Voy. Pôle Sud, Poiss., 1853–'54, 41, pl. 3, f. 3.—GÜNTHER, Cat. Fish., i, 1859, 268; Jour. Mus. Godeff., ii, 1873, Fische der Sudsee, i, 24.

Dules malo, CUV. & VAL., op. cit., vii, 1831, 479.—DUMONT D'URVILLE, Voy. Pôle Sud, Poiss., 1853–'54, 41, pl. 3, f. 4.—GÜNTHER, Cat. Fish., i, 1859, 270.

Dules mato, Lesson, Voy. Coquille, Zoöl., ii, 1826–'30, 223.
Dules leuciscus, Jenyns, Zoöl. Beagle, Fish., 1842, 17.
Moronopsis ciliatus, Bleeker, Arch. Neerl., 1872, 376.
Moronopsis marginatus, Gill, Proc. Acad. Nat. Sci. Phila., 1863, 82.

D. $9\frac{1}{11}$. A. $\frac{3}{11}$. L. lat. 53. L. trans. $\frac{5}{12}$.

Coloration as in *Dules marginatus*, as given by Günther in Fische der Sudsee. Sides of the body spotted.

Locality: Waialua, Oahu.

CHILODIPTERIDÆ.

APOGON AURITUS, *Cuv. & Val.* [No. 15396].

Apogon auritus, Cuv. & Val., Hist. Nat. des Poiss., vii, 1831, 443.—Günther, Jour. Mus. Godeff., ii, 1873, Fische der Sudsee, 1, 23.
Apogon punctulatus, Rüppell, N. W. Fische, 1837, 88, pl. 22, f. 4.
Apogon variegatus, Valenciennes, Nouv. Ann. Mus., i, 55.
Apogonichthys polystigma, Bleeker, Nat. Tyds. Ned. Ind., vi, 1854, 484.
Apogonichthys auritus, Günther, Cat. Fish., i, 1859, 246.—Playfair, Fish. Zanz., 1866, 21.

Locality: Honolulu, Oahu.

PRIACANTHIDÆ.

PRIACANTHUS CAROLINUS, *Cuv. & Val.* [No. 17994].

Priacanthus carolinus, Cuv. & Val., Hist. Nat. des. Poiss., iii, 1829, 105.—Lesson, Voy. Coq. Zoöl. Poiss., ii, 1826–'30, 224.—Bleeker, Nat. Tyds. Ned. Ind., 1851, 235.—Günther, Cat. Fish., i, 1859, 219; Jour. Mus. Godeff., ii, 1873–'75, Fische der Sudsee, i, 17, pl. 18.

Locality: Harbor of Honolulu, Oahu.

Immature specimens. During the month of September, 1873, an immense shoal of the young of this species entered the harbor of Honolulu. The largest of them did not exceed three and a half inches in length. This shoaling, we were told, has occurred a number of times, but at uncertain intervals. The coming of the "red-fish," as they are called, foreshadows in the minds of the simple natives the sickness and death of some member of the royal family; and, on account of the pliant disposition of the Kanakas, the prophecy is usually fulfilled. But the fish are by no means unwelcome visitants to the common people, who are busy catching them night and day, as long as they remain. They are dried, and eaten without cooking.

CIRRHITIDÆ.

CIRRHITES FORSTERI, (*Bl.*) *Gthr.* [No. 17978].

Perca tæniata, FORSTER, Descr. Anim., ed. LICHT., 1844, 224.

Grammistes forsteri, BLOCH, Syst. Ichth., ed. SCHN., 1801, 191.

Sparus pantherinus, LACÉP., Hist. des Poiss., iv, 1803, 160, pl. 6, f. 1.

Cirrhites pantherinus, CUV. & VAL., Hist. Nat. des Poiss., iii, 1829, 70.—LESSON, Voy. Coq. Poiss., 1826–'30, 225, pl. 22, f. 1.—BLEEKER, Nat. Tyds. Ned. Ind., 1851, ii, Banda, i, 232.

Serranus tankervillæ, BENNETT, Fishes of Ceylon, 1834, pl. 27.

Cirrhites forsteri, GÜNTHER, Cat. Fish., ii, 1860, 71.—GILL, Proc. Acad. Nat. Sci. Phila., 1863, 107.—GÜNTHER, Jour. Mus. Godeff, ii, 1874, Fische der Sudsee, i, 69, pl. 49, f. A.

Paracirrhitus forsteri, BLEEKER, Verh. k. Ak. Weten Amst., 1875, xv, 6.

Locality: Honolulu, Oahu.

MUGILIDÆ.

MUGIL CEPHALOTUS, *Cuv. & Val.* [Nos. 18002, 18003].

Mugil cephalotus, CUV. & VAL., Hist. Nat. des Poiss., xi, 1836, 110.—GÜNTHER, Cat. Fish., iii, 1861, 419.

Mugil japonicus, SCHLEG., Faun. Japon. Poiss., 1850, 134, pl. 72, f. 1.

Mugil macrolepidotus, RICHARDSON, Rep. Ichth. Chin., Rep. 15th Meet. Brit. Assoc., 1846, 249.

D. 4 $\frac{1}{8}$. A. $\frac{3}{8}$. L. lat. 40–42. L. trans. 14–15.

The height of the body and the length of the head are nearly equal, and are one-fifth of the total length. Snout broad, depressed, longer than the eye; lips thin, provided with minute cilia. Deep cavity in front of the vomer. The angle formed by the lower jaw in front is a right angle; a narrow stripe of the maxillary is visible behind the intermaxillary; præorbital not emarginate, finely denticulated on its anterior edge and at its extremity, which is obliquely truncated. Cleft of the mouth is not twice as broad as deep. The width of the interorbital space is contained more than twice in the length of the head. Eye nearly covered with a broad adipose membrane, leaving the pupil exposed through a narrow vertical slit in the middle. Three series of scales between the eye and the inferior border of the præoperculum; angle of præoperculum produced posteriorly. Pectoral inserted above the middle of the height of the body; it terminates on the eighth scale of the lateral line; spinous dorsal commences on the tenth scale of the lateral line, and on the twenty-second from the end of the snout; anterior dorsal spines more than one-half the length of the head, and they are situated on the middle between the end of the snout and the base of the caudal fin. The second dorsal commences on the twenty-third row of scales of the lateral line; the space between the origins of the two dorsals nearly equals the length of the head. Ventrals midway between the base of the pectoral and the spinous dorsal. Anal commences before the soft dorsal; both emarginate behind.

Shining golden, darker above, with longitudinal streaks along the series of scales.

Locality: Harbor of Honolulu, Oahu. Very numerous.

There seems to be very little difference between this species and *Mugil dobula*, Gthr.

AULOSTOMIDÆ.

AULOSTOMA CHINENSE, (*L.*) *Schleg.* [No. 15371].

Fistularia chinensis, LINN., Syst. Nat. i, 1766, 515.

Aulostoma chinensis, LACÉP., Hist. des Poiss., v, 1803, 357.

Aulostoma chinense, SCHLEG., Faun. Japon. Poiss., 1850, 320.—RICHARDSON, Rep. Ichth. Chin., Rep. 15th Meet. Brit. Assoc., 1846, 247.—PETERS, Arch. f. Naturg., 1855, i, 258.—GÜNTHER, Cat. Fish., iii, 1861, 538.

Polypterichthys valentini, BLEEKER, Nat. Tyds. Ned. Ind., iv, 1853, Ternate, ii, 608.

D. 10–27. A. 28.

Brownish, with vertical bands along the sides of the body and snout; one or two of the bands on the snout oblique. Base of soft dorsal and anal fins black; a short black streak a little distance from the base anteriorly, more plainly visible on the dorsal than on the anal fin; on the former, another short streak above the first. A round black spot on the base of the ventrals, and one above and below on the caudal fin.

Locality: Honolulu, Oahu.

FISTULARIDÆ.

FISTULARIA SERRATA, *Cuv.* [No. 17988].

Fistularia tabaccaria, var. BLOCH, Naturg. Ausländ, Fische, viii, 1794, 130, pl. 387, f. 2-3.—BLOCH, Syst. Ichth., ed SCHN., 1801, 114.

Fistularia immaculata, CUV., Règne Anim., 1817.—RICHARDSON'S Ichth. Chin., Rep. 15th Meet. Brit. Assoc., 1846, 247.—SCHLEG. Faun. Japon. Poiss., 1850, 320.—BLEEKER, Nat. Tyds. Ned. Ind., iii, 1852, Amb. & Cer., 281; Verh. Acad. Wet. Amsterd., Japan, ii.

Fistularia serrata, CUV., Règne Anim., 1817.—GÜNTHER, Cat. Fish., iii, 1861, 533.

Fistularia commersoni, RÜPPELL, N. W. Fische, 1837, 142.—PETERS, Arch. f. Naturg., 1855, i, 258.

Canuorhynchus immaculatus, CANTOR, Catalogue, 211.

Locality: Honolulu Harbor, Oahu.

BELONIDÆ.

BELONE PLATURA, *Rüpp.* [No. 17983].

Belone platura, RÜPPELL, N. W. Fische, 1837, 73, pl. 20, f. 1.—CUV. & VAL., Hist. Nat. des Poiss., xviii, 1846, 451.—BLEEKER, Act. Soc. Sc. Indo-Ned., ii, 1857, Amboina, viii, 85.—GÜNTHER, Cat. Fish., vi, 1866, 237.—KLUNZINGER, Verh. zoöl.-bot. Ges., xxi, 1871, Fische d. Roth. Meer, 577.

Belone carinata, CUV. & VAL., op. cit., xviii, 1846, 437.—GÜNTHER, Cat. Fish., vi, 1866, 236.

D. 14–15. A. 19–20.

Body subpentagonal; tail depressed, strongly carinated; the median shallow groove on the upper surface of the head scaly. Two specimens gave nineteen rays in the anal fin, and one gave twenty.

Length, 15 inches.

Locality: Harbor of Honolulu, Oahu.

SCOMBERESOCIDÆ.

EXOCŒTUS SPECULIGER, *Cuv. & Val.* [No. 17985].

Exocœtus speculiger, CUV. & VAL., Hist. Nat. des Poiss., xix, 1846, 94.—BLEEKER, Ned. Tydsch. Dierk., iii, 1865, 122.—GÜNTHER, Cat. Fish., vi, 1866, 287.

Origin of the dorsal fin is behind the anal; pectoral with an oblique white band across its lower half anteriorly; white edged. Ventrals white; grayish in the axil, and with the middle rays gray.

Locality: Hawaiian Islands.

EXOCŒTUS BRACHYPTERUS, *Solander* [No. 17986].

Exocœtus brachypterus, SOLANDER, MSS.—RICHARDSON, Rep. Ichth. Chin., Rep. 15th Meet. Brit. Assoc., 1846, 265.—GÜNTHER, Cat. Fish., vi, 1866, 280.

Exocœtus mento, CUV. & VAL., Hist. Nat. des Poiss., xix, 1846, 124.—BLEEKER, Verh. Bat. Gen., xxiv, 1852, Snœk., 21.—GÜNTHER, Cat. Fish., vi, 1866, 281.

Parexocœtus mento, BLEEKER, Ned. Tydschr. Dierk., iii, 1865, 126.

D. 12. A. 13.

One or two very short barbules at the symphysis of the lower jaw. Height of the body is contained 5½ times in the total length, and the length of the head 4⅓ times in the same. Snout shorter than the eye. Interorbital space flat, and its width equals the diameter of the eye; the latter is one-third of the length of the head. Origins of the dorsal and anal fins opposite to each other; dorsal high and pointed; the anterior rays, when laid backward, reach to the caudal fin. Anal very low. Lower caudal lobe longer than the head. Length of the pectoral is one-half of the total length, reaching nearly to the middle of the dorsal fin. Ventrals extend to the anal, and are inserted midway between the snout and the root of the caudal fin. The upper part of the dorsal is black; pectorals blackish, anals and ventrals whitish.

Total lengths, 6.00, 6.50 inches.

Locality: Hawaiian Islands.

SCOPELIDÆ.

SAURIDA NEBULOSA, *Cuv. & Val.* [No. 15392].

Saurida nebulosa, CUV. & VAL., Hist. Nat. des Poiss., xxii, 1849, 504, pl. 649.—BLEEKER, Nat. Tyds. Ned. Ind., iii, 1852, 292.—GÜNTHER, Cat. Fish., v, 1864, 399.—KLUNZINGER, Verh. zoöl.-bot. Ges., xxi, 1871, Fische d. Roth. Meer, 591.

D. 11. A. 9–10. L. lat. 52.

In the older specimens the spots are more or less aggregated, those on the sides of the body forming transverse bands extending to below the lateral line.

Locality: Honolulu, Oahu.

ALBULIDÆ.

ALBULA CONORHYNCHUS, *Bl. Schn.* [No. 18004.]

Argentina glossodonta, FORSK., Descr. Anim., 1775, 68.

Albula conorhynchus, BLOCH, Syst. Ichth., ed. SCHN., 1801, 432.—CUV. & VAL., Hist. Nat. des Poiss., xix, 1846, 356.—GÜNTHER, Cat. Fish., vii, 1868, 468.

Butirinus glossodontus, RÜPPELL, N. W. Fische, 1837, 80, pl. 20, f. 3.—SCHLEG., Faun. Japon. Poiss., 1850, 242, pl. 109, f. 1.

Esox argenteus, FORSTER, Descr. Anim., ed. LICHT., 1844, 196.

Albula bananus, CUV. & VAL., op. cit., xix, 1846, 345.—BLEEKER, Verh. Bat. Gen., xxiv, 1852, Chiroc., 11.

Albula glossodonta, KLUNZINGER, Verh. zoöl.-bot. Gesel., xxi, 1871, Fische d. Roth. Meer, 602.

Locality: Honolulu, Oahu.

MURÆNIDÆ.

MURÆNA UNDULATA, (*Lacep.*) *Gthr.* [No. 17982].

Murænophis undulata, LACEP., Hist. des Poiss., v. 1803, 629–644.

Muræna cancellata, RICHARDSON, Voy. Ereb. and Terr., Fish., 1848, 87, pl. 46, f. 1–5.—BLEEKER, Verh. Bat. Gen., xxv, 1853, *Mur.*, 74; Nat. Tyds. Ned. Ind., v. 1853, 1853, 531; viii, 1855, 326.

Muræna valencienni, EYD. & SOUL., Voy. Bonite, Poiss., 207, pl. 8, f. 1.

Muræna agassizi, BLEEKER, Nat. Tyds. Ned. Ind., viii, 1855, 458.

Thyrsoidea cancellata, KAUP, Apod. Fish., 1856, 76, f. 59.

Gymnothorax cancellatus, BLEEKER, Atl. Ichth., iv, 1864, *Mur.*, 93, pl. 32, f. 3, pl. 33, f. 2, pl. 39, f. 1.—KNER, Novara Exped., Fisch., 1869, 384.

Gymnothorax agassizi, BLEEKER, Atl. Ichth., iv, 1864, *Mur.*, 95, pl. 41, f. 2.

Gymnothorax blochi, BLEEKER, Atl. Ichth., iv, 1864, *Mur.*, 102, pl. 36, f. 2 (young).

Muræna blochi, BLEEKER, Verh. Bat. Gen., xxv, 1853, *Mur.*, 49; Nat. Tyds. Ned. Ind., vii, 1854, 102.

Muræna undulata, GÜNTHER, Cat. Fish., viii, 1870, 110.

Locality: Coral reefs at Honolulu, Oahu.

One specimen resembling Bleeker's figure 3, on plate 32 of Atlas. In another specimen the yellow lines are more interrupted and less distinctly defined, as is shown in figure 1, plate 39, of the same work.

GALEORHINIDÆ.

TRIAKIS SEMIFASCIATA, *Girard* [No. 17975].

Triakis californica, GRAY, Chondropter., 56 (No descr.).

Triakis semifasciatum, GIRARD, Proc. Acad. Nat. Sci. Phila., 1854, 196; U. S. Pac. R. R. Rep., x, 1858, Fish., 362.

Mustelus felis, AYRES, Proc. Cal. Acad. Nat. Sci., 1854, 17.

Triacis semifasciata, GÜNTHER, Cat. Fish., viii, 1870, 384.

A row of rounded black spots along the sides of the body, alternating with transverse bands, which unite across the median line of the back. Also small round black spots between the cross-bars on the median line of the back, and others alternating with the larger spots on the sides.

Locality: North Pacific Ocean. Fœtus. The specimens were obtained in Honolulu, whither they had been brought by a whaler.

III.—Fishes of the Fanning Group.

TETRODONTIDÆ.

TETRODON IMPLUTUS, *Jenyns** [No. 19214].

Locality: Palmyra and Christmas Islands.

Specimens large, and sparsely spinous. Round bluish-white spots on the dorsal regions numerous, and the longitudinal lines on the under surface indistinct.

TETRODON NIGROPUNCTATUS, *Bl. Schn.* [No. 19215].

Tetrodon nigropunctatus, Bloch, Syst. Ichth., ed. Schn., 1801, 507.—Günther, Cat. Fish., viii, 1870, 293.—Klunzinger, Verh. zoöl.-bot. Ges., xxi, 1871, Fische d. Roth. Meer, 643.

Tetraodon diadematus, Rüppell, Atl. Fisch., 1828, 65, pl. 17, f. 3.—Günther, Cat. Fish., viii, 1870, 293.

Tetrodon trichoderma, Bleeker, Nat. Tyds. Ned. Ind., v, 1853, Sumatra, 532.

Tetrodon trichodermatoides, Bleeker, Nat. Tyds. Ned. Ind., vi, 1854, Flores, 336.

Arothron melanorhynchus, Bleeker, Nat. Tyds. Ned. Ind., ix, 1855, 111.

Arothron trichoderma, Bleeker, Enum. Pisc. Arch. Ind., 1859, 201.

Arothron trichodermatoides, Bleeker, Enum. Pisc. Arch. Ind., 1859, 202.

Crayracion nigropunctatus, Bleeker, Atl. Ichth., v, 1865, *Gymnod.*, 74, pl. 2, f. 4.

Locality: Fanning Group.

This specimen belongs to what Günther calls *citrinella*, a variety of *nigropunctatus*. It is characterized by its lemon color, with small scattered black spots on the sides, and large and small irregular black spots on the back; by its black dorsal fin, with a large black blotch around its base; eye-lids black, and black around the gill-openings.

OSTRACIONTIDÆ.

OSTRACION TUBERCULATUS, *Linn.* [No. 19216].

Ostracion tetragonus, Linn., Mus. Ad. Fred., 1754, 59.—Bleeker, Atl. Ichth., v, 1865, *Ostrac.*, 39, pl. i, f. 2, pl. 3, f. 2.—Günther, Fish. Zanzi., 1866, 129.

Ostracion tuberculatus, Linn., Syst. Nat., i, 1766, 409.

Ostracion cubicus, Linn., Syst. Nat., i, 1766, 410.—Bloch, Ichth., iv, 1787, 115, pl. 137.—Lacép., Hist. des Poiss., i, 1798, 461, pl. 22, f. 1.—Rüppell, Atlas Fische, 1828, 3.—Bleeker, Verh. Bat. Gen., xxiv, 1852; *Balist. en Ostrac.*, 35, pl. 7, f. 14.—Hollard, Ann. Sc. Nat., vii, 1857, 162.—Günther, Cat. Fish., viii, 1870, 260.—Klunzinger, Verh. z.-b. Ges., xxi, 1871, 635.

Ostracion bituberculatus, Bloch, Syst. Ichth., ed. Schn., 1801, 501.

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* See synon. under Hawaiian Fishes.

Ostracion cyanurus, RÜPPELL, Atl. Fische, 1828, 4, pl. 1, f. 2.—HOLLARD, Ann. Sc. Nat., 1857, vii, 167.

Ostracion argus, RÜPPELL, op. cit., pl. 1, f. 1.

Ostracion immaculatus, SCHLEG., Faun. Japon. Poiss., 1850, 296.—BLEEKER, Verh. Bat. Gen., xxv, 1853, Nat. Ichth. Japan, 55.

Ostracion tesserula, BLEEKER, Nat. Tyds. Ned. Ind., iii, 1852, 305 (young).

Carapace four-ridged, without spines. Body with bluish black-edged ocelli, one in the center of each scute.

Locality: Fanning Group.

BALISTIDÆ.

BALISTES ACULEATUS, *Linn.* [No. 19217.]

Balistes aculeatus, LINN., Syst. Nat., i, 1766, 406.—BLOCH, Ausländ. Fisch., ii, 1786, 19 pl. 149.—BLOCH, Syst. Ichth., ed. SCHN., 1801, 465.—LACÉP., Hist. des Poiss., i, 1798, 367, pl. 17, f. 1.—BENNETT, Beechey's Voy. Zoöl., 1839, 69, pl. 22, f. 2.—JENYNS, Zoöl. Beagle, Fish., 1842, 155.—BLEEKER, Verh. Bat. Gen., xxiv, 1852, *Balist.*, 15.—HOLLARD, Ann. Sc. Nat., i, 1855, 333.—GÜNTHER, Cat. Fish., viii, 1870, 223.

Balistes ornatissimus, LESSON, Voy. Coq. Zoöl. Poiss., i, 1830, 119, pl. 10, f. 1.

Balistes armatus, CUV., Règne Anim. Ill. Poiss., 1829-'30, pl. 112, f. 2.

Balistes striatus, GRONOV., Syst. (1780), ed. GRAY, 1854, 32.

Balistes (Balistapus) aculeatus, BLEEKER, Atl. Ichth., v, 1865, 120, pl. 216, *Balist.*, pl. 2, f. 3.

Locality: Fanning Group.

PLEURONECTIDÆ.

RHOMBOIDICHTHYS LEOPARDINUS, *Gthr.* [No. 19218].

Rhomboidichthys leopardinus, GÜNTHER, Cat. Fish., iv, 1862, 43.

The posterior half of the lower eye falls vertically below the upper; the interorbital space concave, its width equaling the longitudinal diameter of the eye, and scaly only on its posterior half; anterior half naked. Brownish spots, and blue-edged ocelli scattered over the body and fins.

Locality: Fanning Group.

This species is very closely allied to *R. pantherinus*, but it may readily be distinguished by the naked anterior-half of the interocular space, and by the scattered ocelli. Günther records it without a habitat, and this is the first instance, to our knowledge, where a locality has been assigned to it.

BLENNIIDÆ.

SALARIAS QUADRICORNIS, *Cuv. & Val.* [No. 19219].

Salarias quadricornis, CUV. & VAL., Hist. Nat. des Poiss., xi, 1836, 329, pl. 329.—GÜNTHER, Cat. Fish., iii, 1861, 255.—KLUNZINGER, Verh. zoöl.-bot. Ges., xxi, 1871, Fische d. Roth. Meer, 476.

D. 12 | 20. A. 21–23. V. 2.

Dorsal notched, and continued on the base of the caudal. Head crested. Tentacles over the eyes, on the sides of the neck, and at the nostrils; the latter are fringed the former are as long as the eye and those on the neck are very short. Transverse streaks arranged in pairs on the sides of the body and ascending on the dorsal fin at its base; spinous dorsal with undulating lines; the soft dorsal with oblique lines ascending backward; the anal with three fine lines, the lowest of which is discontinued anteriorly. The anterior dorsal is lower than the posterior, and both are lower than the body and higher than the anal.

Locality: Fanning Group.

SCARIDÆ.

PSEUDOSCARUS GLOBICEPS, (*Cuv. & Val.*) *Gthr.* [No. 19220].

Scarus globiceps, CUV. & VAL., Hist. Nat. des. Poiss., xiv, 1839, 242.—JENYNS, Voy. Beagle, Fishes, 1842, 106.

Pseudoscarus globiceps, GÜNTHER, Cat. Fish., iv, 1862, 224; Fish. Zanz., 1866, 105.

Pseudoscarus spilonotus, KNER, Sitz. d. k. Ak. d. Wissen. Wien, lviii, i, 1868, 31, 352, pl. 9, f. 26.

A deep black ocellus on the scale covering the base of the fourth dorsal spine. Body spotted; spots principally confined to the upper and anterior parts of the body.

Locality: Fanning Group.

PSEUDOSCARUS JONESI, n. sp. [No. 19221].

D. $\frac{9}{10}$. A. $\frac{2}{9}$. L. lat. 24. L. trans. 8. Head, 3½. Height, 3½ in total.

Jaws greenish; lips very narrow, covering only the base of the jaws. Two series of scales on the cheeks; seven scales in the lower series; the lower præopercular limb entirely naked. Upper profile of the head convex, not gibbous. In one specimen there is a short tooth on each side at the angle of the lower jaw, but it is absent in all the rest (three). Caudal lobes slightly produced. Fourteen rays in the pectoral fin.

Color (in spirits) greenish-olive, yellowish about the mouth. A broad irregularly-outlined band across the snout, and from its extremities there passes backward a prolongation which touches the anterior margin of the orbit, and then passes along the superior border of the eye to the posterior part of the interorbital space, where it joins with its fellow of the opposite side, inclosing an irregularly-shaped triangular space on the front of the interocular region. Frequently (in smaller specimens) there is a narrow dark streak from the superior border of the orbit toward the middle of the interorbital space; this streak is sometimes reduced to rounded spots in the same situation; a short streak from the middle of the posterior margin of the eye; a band below the eye, commencing near its anterior edge, and prolonged beyond the posterior margin. Frequently two ocelli, one on either side, in front of the band on the snout, and also one behind and above the angle of the mouth; a very narrow band around the margin of the upper lip; a broad band around the lower jaw, the two halves of which scarcely meet below in the median line; it broadens above, just below the angle of the mouth, where it is directed backward; it frequently arches downward and backward in this situation. It coalesces with the narrow supramaxillary band, and in some instances a narrow band passes from it to the band across the snout. Occasionally there is an ocellus on the lower jaw, behind the marginal band. Dorsal and anal fins with a narrow band along the margin, and with one or two rows of intermarginal spots. Frequently (in young specimens) these spots are confluent transversely or longitudinally, forming either vertical streaks or longitudinal bands. Caudal with reticulating transverse bands.

Lengths, 14, 12, 11 inches.

Locality: Palmyra Island.

To William H. Jones, M. D., Surgeon, U. S. N., an indefatigable collector in natural history, and to whose zeal we are chiefly indebted for this collection, I dedicate this species, in remembrance of pleasant hours passed together as collaborers, and as messmates.

PSEUDOSCARUS ÆRUGINOSUS, *Blkr.* [No. 19221].

? *Scarus æruginosus*, Cuv. & Val., Hist. Nat. des Poiss., xiv, 1839, 257.

Scarus lacerta, Cuv. & Val., op. cit., 217.

Scarus æruginosus, Bleeker, Ver. Bat. Gen., xxii, 1849, *Labr.*, *Cycl.*, 58.

Pseudoscarus æruginosus, Bleeker, Atl. Ichth., i, 1862, *Labr.*, 40, pl. 17, f. 2—Günther, Cat. Fish., iv, 1862, 229.

Color (in spirits) greenish on the sides of the body and head, brownish above, along the back and head; three silvery longitudinal bands along the side of the abdomen; the first commencing at the lower part of the base of the pectoral fin; the third above the base of the ventrals, extending to the anal fin. Fins reddish; spinous dorsal with a very narrow darker margin.

Lengths, 8, 8, 5.50 inches.

Locality: Fanning Islands.

LABRIDÆ.

CHEILINUS UNIFASCIATUS, n. sp. [No. 19222].

D. $\frac{9}{10}$. A. $\frac{3}{8}$. L. lat. 22. L. trans. $9\frac{1}{2}$.

Height of the body three and a half times in the total length, and the length of the head from three to three and one-fifth times in the same. Snout elongated, conical, lower jaw projecting. Diameter of the eye is one-third the length of the snout, and one-half the width of the præorbital; the center of the pupil is midway between the angle of the operculum and the point of the snout. The anterior tubules of the lateral line with a single lateral branch. Two rows of scales on the cheeks; the lower series does not cover the inferior præopercular limb. Caudal fin rounded, with the upper and lower lobes very slightly produced. Body reddish (in spirits), with branching lines passing from the eye over the snout; anastomosing lines on the cheeks, extending to the margins of the sub- and inter-operculum; a yellowish streak from the inferior border of the orbit to the superior axil of the pectoral fin; and above this another streak, similar but somewhat fainter outlined, extending from the posterior border of the eye to the end of the operculum; the upper surface of the head covered with reticulated markings. A broad band from the end of the dorsal to the end of the anal fin, and continued obliquely forward on the posterior rays of the dorsal; dorsal violet, with a light margin, and a light median line. Anal less deeply tinted with violet than the dorsal; in younger specimens nearly immaculate, with a light streak along the center; rays green. Upper and lower lobes of the caudal violet, the intermediate rays deep green. Basal half of the ventrals of a deep violet.

Lengths, 8.50, 10.00, 10.50, 11.00, 11.50 inches.

Locality: Fanning Group.

This species is apparently very closely allied to *Cheilinus rhodochrous*, Gthr., which, however, is a slenderer fish, with much less depth of body. This is the most important distinction between them.

JULIS UMBROSTIGMA, *Rüpp.* [No. 19223].

Julis umbrostigma, RÜPPELL, N. W. Fische, ii, 1837, pl. 3, f. 2.—BLEEKER, Atl. Ichth., i, 1862, 92, pl. 34, f. 2.—GÜNTHER, Cat. Fish., iv, 1862, 185.—KNER, Fische Novara Exped., 1869, 257.—KLUNZINGER, Verh. zoöl.-bot. Gesel., xxi, 1871, Fische d. Roth. Meer, 538.
Julis souleyeti, CUV. & VAL., Hist. Nat. des Poiss., xiii, 1839, 457.

Body with small blackish vertical streaks on the scales; spots scattered over the head; three or four short streaks from the upper and posterior portion of the orbit; a pair of short streaks between the eyes, and two on the upper surface of the snout; a single round spot between the two pairs; an oblique streak on each side of the snout, parallel with the upper lip; another, and shorter, streak on the side of the snout, extending downward from before the eye and coalescing with the extremity of the first. Dorsal with a black spot anteriorly between the first and third spines.

Locality: Fanning Islands.

JULIS GÜNTHERI, *Bleeker* [No. 19224].

Julis quadricolor, BLEEKER, Act. Soc. Sc. Indo-Nederl., i, 1856, Manad., 55.
Julis güntheri, BLEEKER, Versl. Akad. Wet. Amst., xiii, 1862, 279; Atl. Ichth., i, 1862, *Labr.*, 94, pl. 34, f. 1.—GÜNTHER, Cat. Fish., iv, 1862, 188.

Three specimens similar in every particular, and agreeing with descriptions.

Two longitudinal denticulated bands on the sides of the body—one running from the nape of the neck, just above the anterior portion of the lateral line, to the extremity of the upper caudal lobe; the second commencing behind the angle of the operculum and extending to the middle of the caudal fin. Two curved bands on the sides of the head—one from the upper jaw, through the eye, to the angle of the operculum; the other from the under surface of the lower jaw, along the inferior border of the eye, to opposite the base of the pectoral fin; a U-shaped band across the occiput, pointing backward and downward; two slightly arched bands between the eyes, from the antero-superior and postero-superior margins, inclosing the interocular space; sometimes the extremities of these bands are united through the superior edge of the eye, forming a ring around the interorbital region; in one instance a third band crossed the center of the space between the eyes; an oblique band on the breast below the base of the pectoral fin. Dorsal fin with a black spot anteriorly; the fin with a dark margin; anal uniformly colored. The tip of the pectoral fin black; a black spot on the upper part of the base.

In one specimen short vertical streaks pass from one longitudinal band to the other on the sides.

Lengths, 5.50, 5.00, 4.50 inches.

Locality: Fanning Islands.

JULIS MELANOCHIR, *Bleeker*. [No. 19225].

Julis melanochir, BLEEKER, Act. Soc. Sc. Indo-Nederl., ii, 1857, Amboina viii, p. 77; Atl. Ichth. i, 1862, *Labr.*, 89, pl. 33, pl. 2.—GÜNTHER, Cat. Fish., iv, 1862, 182.

Head violet, with two narrow blue black-edged lines on the sides; one extending from the posterior border of the eye to the point of the operculum; the other from the angle of the mouth to the junction of the sub- and inter-operculum. Body green. Dorsal fin with a light edge and a dark intramarginal line; anal with a light margin. A rounded, transverse black spot across the posterior border of the pectoral fin; a black spot in the axil above.

Locality: Fanning Islands.

JULIS LUNARIS, (*L.*) *Cuv. & Val.* [No. 19226].

Labrus lunaris, LINN., Syst. Nat. i, 1766, 474.
Scarus gallus, FORSK., Descr. Anim., 1775, 26.
Labrus viridis, BLOCH, Ausländ. Fische, v, 1786, 129, pl. 282.
Julis porphyrocephala, BENNETT, Proc. Comm. Zoöl. Soc., ii, 183.
Julis duperrei, QUOY & GAIM., Voy. Uran. Zoöl., 1824, 268, pl. 56, f. 2.
Julis lunaris, CUV. & Val., Hist. Nat. des Poiss., xiii, 1839, p. 409.—BLEEKER, Verh. Bat. Gen., xxii, 1849, *Labr.*, 28; Atl. Ichth., i, 1862, *Labr.*, 90, pl. 33, f. 5.—GÜNTHER, Cat. Fish., iv, 1862, 180; Fish. Zanz., 1866, 97.—KNER, Fische Novara Exped., 1869, 256.—KLUNZINGER, Verh. zoöl.-bot. Ges., xxi, 1871, Fische d. Roth. Meer, 535.
Julis viridis, CUV. & VAL., op. cit., 420.
Julis meniscus, CUV. & VAL., op. cit., 415.
Julis martensii, CUV. & VAL., op. cit., 421.
Julis trimaculatus, RÜPPELL, N. W. Fische, 1837, 13.
Julis celebicus, BLEEKER, Nat. Tyds. Ned. Ind., ix, 1855, Celebes, viii, 313.
Julis lutescens (SOLANDER), BENNETT, Zoöl. Beechey's Voy. Fishes, 1839, 65, pl. 19, f. 2.

Caudal lobes much produced; the second ray of the ventral fin prolonged.

Head violet, with two or three streaks from the hinder margin of the eye, deflexed obliquely across the operculum; a curved band on the side of the head below the eye. Body green, with a vertical streak at the base of each scale. Dorsal and anal fins with dark base and light margin. A longitudinal oblong black spot on the upper part of the pectoral fin.

Locality: Fanning Islands.

JULIS ANEITENSIS, *Gthr.* [No. 19227].

Julis aneitensis, GÜNTHER, Cat. Fish, iv, 1862, 183.

Height equals the length of the head, and one-fourth of the total length (caudal lobes not included). Colors (in spirits), bluish on the shoulder; no light cross-band behind the pectorals; bands on the side of the head; two behind the eye, the upper extending to the origin of the lateral line, and the second from the middle of the posterior border of the eye to the point of the operculum; a third from above the angle of the mouth, across the lower border of the eye, to opposite the base of the pectoral fin; a curved band on the cheek below the eye, commencing on the edge of the suboperculum, turning upon itself behind the angle of the mouth, and terminating on the interoperculum. Body, greenish; each scale with a vertical streak. A broad oblique black band across the posterior half of the pectoral fin, and a black spot in the axil above. Dorsal fin with a broad light margin, and an intramarginal band, edged with a fine black line above and below; the lower line is very near the base of the fin; a black spot anteriorly on the dorsal between the second and third spines. Anal light colored, base dark; the dark portion limited by a fine black line similar to those on the dorsal.

Locality: Fanning Islands.

This species is apparently very closely allied to *Julis hebreica*, and is probably an eastern representative of that species.

GOMPHOSUS UNDULATUS, n. sp. [No. 19228].

D. $\frac{8}{13}$. A. $\frac{2}{11}$. L. lat. 27. L. trans. $\frac{3}{9}$.

Height of the body 4½ times in the total length, and the length of the head 2½ times in the same. Caudal fin truncated; lobes very slightly produced. Color in spirits: Head brownish-olive; a broad irregular band from the snout through the lower part of the eye to the operculum. Body glaucous-olive, lighter on the breast, and with a vertical purplish streak at the base of each scale on the sides. Dorsal and anal fins with narrow transparent margins; the former with a median row of irregularly-shaped light spots; the other portion of the fin purplish; from the upper margin of the purple portion slender, tooth-like streaks extend upward into the transparent margin between the rays. Anal with a narrow purplish band along the base, with its margin dentated; a band of the same color along the center, the upper margin of which is scalloped, and from the lower margin are tooth-like streaks similar to those on the dorsal. A blackish transverse streak across the posterior part of the pectoral fin, and a black spot above on the base.

Length, 9 inches.

Locality: Fanning Islands.

Allied to *G. varius*, the principal difference between them being the markings on the vertical fins.

POMACENTRIDÆ.

GLYPHIDODON SEPTEMFASCIATUS, (*C. & V.*) *Gthr.* [No. 19229].

Glyphisodon septemfasciatus, CUV. & VAL., Hist. Nat. des Poiss., v, 1830, 463.—BLEEKER, Nat. Tyds. Ned. Ind., iii, 1852, Sumatra, i, 582.

Glyphidodon septemfasciatus, GÜNTHER, Cat. Fish., iv, 1862, 40.

$$\text{D. } \frac{13}{12\text{–}13}. \quad \text{A. } \frac{2}{12\text{–}13}. \quad \text{L. lat. 29.} \quad \text{L. trans. } \tfrac{3}{11}.$$

Scales between the eyes do not reach as far forward as the anterior border of the orbit. Seven transverse bands on the side of the body, broader than the spaces between them; the first and second band situated in front of the commencement of the spinous dorsal fin; third, fourth, and fifth bands under the spinous dorsal; sixth under the soft dorsal; seventh on the caudal peduncle behind the dorsal and anal fins. Upper half of the spinous dorsal blackish; caudal lobes tipped with black.

Locality: Palmyra Island.

GLYPHIDODON SORDIDUS, (*Forst.*) *Gthr.* [No. 19230].

Chætodon sordidus, FORST., Descr. Anim., 1775, 62, no. 87.—BLOCH, Syst. Ichth., ed. SCHN., 1801, 230.

Pomacanthus sordidus, LACÉP., Hist. des Poiss., iv, 1803, 519.

Glyphisodon sordidus, RÜPPELL, Atl. Fische, 1828, 34, pl. 8, f. 1.—CUV. & VAL., Hist. Nat. des Poiss., v, 1830, 466.—BLEEKER, Verh. Bat. Gen., xxi, 1846, *Labr.*, *Cten.*, 16.

Glyphidodon sordidus, GÜNTHER, Cat. Fish., iv, 1862, 41.

Scales between the eyes extend forward to the anterior border of the orbit. Six cross-bands on the body. A large round black spot above on the caudal peduncle, behind the dorsal fin.

Locality: Palmyra Island. Found in company with *G. septemfasciatus*.

ACANTHURIDÆ.

ACANTHURUS BLOCHI, *C. & V.** [No. 19231].

Locality: Fanning Islands. All old specimens.

ACANTHURUS TRIOSTEGUS (*L.*) *Bl. Schn.* [No. 19232].

Chætodon triostegus, Linn., Syst. Nat., i, 1766, 463.

Acanthurus triostegus, Bloch, Syst. Ichth., ed. Schn., 1801, 215.—Cuv. & Val. Hist. Nat. des Poiss., x, 1835, 197.—Bleeker, Verh. Bat. Gen., xxiii, 1850, *Teuth.*, 13.—Jenyns, Voy. Beagle, Fishes, 1842, 75.—Günther, Cat. Fish., iii, 1861, 337; Jour. Mus. Godeff., ii, 1875, Fische der Sudsee, i, 108.

Harparus fasciatus, Forst., Descr. Anim., ed. Licht., 1844, 216.

Acanthurus zebra, Lacép, Hist. des Poiss., iv, 1803., 546, pl. 6, f. 2.

Chætodon zebra, Lacép., op. cit., iii, pl. 25, f. 3.

Chætodon couagga, Lacép., op. cit., iv, 727.

Acanthurus hirudo, Bennett, Fish. of Ceylon, 1834, 11, pl. 11.

Locality: Fanning Islands.

ACANTHURUS ACHILLES, *Shaw* [No. 19233].

Acanthurus achilles, Shaw, Zoöl., iv, 1803, 383.—Cuv. & Val., Hist. Nat. des Poiss., x, 1835, 218.—Günther, Cat. Fish., iii, 1861, 340; Jour. Mus. Godeff, ii, 1875, Fische der Sudsee, i, 115, pl. 71, f. B.

$$D.\ \frac{9}{30\text{–}31}.\quad A.\ \frac{2}{28}.$$

Color (in spirits) blackish-brown; a large triangular spot, with a rounded base, on the posterior part of the side of the body, with the apex of the triangle embracing the lateral spine (spot red in life); a narrow bluish margin to the dorsal and anal fins; a narrow band along the base of each (red in life); a blue band around the lower jaw; the subopercular margin with a white spot (blue in life); and the outer rays of the ventral fins blue; margin of the caudal fin white; a crescent across the middle portion of the latter separated from the light margin by a narrow brown band.

Locality: Fanning Islands.

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* See synonymy under Hawaiian Fishes.

CHÆTODONTIDÆ.

CHÆTODON SETIFER, *Bl.* [No. 19234].

Chætodon setifer, BLOCH, Naturg. ausländ. Fische. 1797, pl. 426, 1.—BLOCH, Syst. Ichth., ed. SCHN., 1801, 225.—CUV. & VAL., Hist. Nat. des Poiss., vii, 1831, 76.—GÜNTHER, Cat. Fish., ii, 1860, 6; Jour. Mus. Godeff., ii, 1874, Fische der Sudsee, i, 36, pl. 26, f. B.

Pomacentrus filamentosus, LACÉP., Hist. des Poiss., iv, 1803, 506, 511.

Chætodon sebanus, CUV. & Val., op. cit., 74.

Chætodon auriga, var. RÜPPELL, N. W. Fische, 1837, 28.

Chætodon lunaris, GRONOV., Syst. (1780), ed. GRAY, 1854, 70.*

Chætodon auriga, BLEEKER, Nat. Tyds. Ned. Ind., v, 1853, Celebes, iv, 164.

Locality: Fanning Islands.

CARANGIDÆ.

CARANGUS ASCENSIONIS, (*Forst.*) *Streets* [No. 19235].

Scomber ascensionis, FORSTER, Descr. Anim., ed. LICHT., 1844, 412.—BLOCH, Syst. Ichth., ed. SCHN., 1801, 33.

Caranx ascensionis, CUV. & VAL., Hist. Nat. des Poiss., ix, 1833, 102, pl. 249.—GÜNTHER, Cat. Fish., ii, 1860, 432; Jour. Mus. Godeff., 1876, part xi, Fische der Sudsee, part v, 132, pl. 85.

D $8\frac{1}{21}$. A. $2\frac{1}{17}$. L. lat. (plates) 30.

The height of the body is one-third of the total length (without caudal); head higher than long; its length is contained 3½ times in the total length (without caudal); diameter of the eye is two-thirds of the length of the snout, and is contained 4½ times in the length of the head. Upper maxillary extends to the vertical from the center of the eye. Occipital crest much elevated; forehead in front of the eyes concave. Teeth enlarged in the upper jaw anteriorly. The arched portion of the lateral line equals the length of the head, and is about two-thirds of the length of the straight portion. The line becomes straight below the third ray of the second dorsal fin. Pectoral fin scythe-shaped; the upper rays much produced, and extending beyond the origin of the anal. Color (in spirit) uniform brownish; vertical fins somewhat darker, and purplish.

Total length, 15.50 inches.

Locality: Fanning Islands.

CHORINEMUS SANCTI PETRI, *Cuv. & Val.*[*] [No. 19236].

Adult specimens, 18–19 inches long. Two rows of blackish round spots on the sides, one above and the other below the lateral line; a blackish streak from above the eye to the shoulder, above the base of the pectoral fin. Top of the dorsal fin black; a black spot on the anal anteriorly.

Locality: Christmas Island. Abundant. Swim near the surface of the water.

MULLIDÆ.

MULLOIDES FLAVOLINEATUS, (*Lacép.*) *Blkr.* [No. 19237].

Mullus flavolineatus, LACÉP., Hist. des Poiss., iii, 1803, 406.

Mullus aureovittatus, SHAW, Zoöl., iv, 1803, 618.

Upeneus flavolineatus, CUV. & VAL., Hist. Nat. des Poiss., iii, 1829, 456.—RÜPPELL, N. W. Fische, 1837, 101, pl. 26, f. 1.—JENYNS, Zoöl. Beagle, Fish., 1842, 24.

Mulloides flavolineatus, BLEEKER, Nat. Tyds. Ned. Ind., iii, 1852, Ceram, ii, 697.—GÜNTHER, Cat. Fish., i, 1859, 403; Jour. Mus. Godeff., ii, 1873, Fische der Sudsee, i, 56.

A broad yellow band below the middle of the body from the operculum to to the tail; yellow lines on the snout; fins without spots.

Length, 11 inches.

Locality: Fanning Islands.

BERYCIDÆ.

HOLOCENTRUM SPINIFERUM, (*Forsk.*) *Gthr.* [No. 19238].

Sciæna spiniferum, FORSK., Descr. Anim., 1775, 49.

Perca spiniferum, BLOCH, Syst. Ichth., ed. SCHN., 1801, 86.—LACÉP., Hist. des Poiss., iv, 1803, 418.

Holocentrum leo, CUV. & VAL., Hist. Nat. des Poiss., iii, 1829, 204.—LESSON, Voy. Coq., ii, 1830, 222.—QUOY & GAIM., Voy. Astrol. Poiss., 1834, 678, pl. 14, f. 3.—CUVIER, Règne Anim. Ill., pl. 14, f. 1.—BLEEKER, Nat. Tyds. Ned. Ind., vii, 1854, Kokos-eil., 355.

Holocentrus spinifer, RÜPPELL, N. W. Fische, 1837, 96, pl. 25, f. 1.

Holocentrum spiniferum, GÜNTHER, Cat. Fish., i, 1859, 39; Jour. Mus. Godeff., ii, 1874, Fische der Sudsee, i, 94.

The profile of the head concave; snout pointed, longer than the diameter of the eye; the end of the maxillary extends to under the anterior portion of the eye. Posterior border of the præoperculum oblique, dentated, the long spine at the angle longer than one-half of the posterior border; two flat opercular spines, the upper the larger; margin serrated; suboperculum entire; interoperculum serrated above only; scapular dentated. The third anal spine as long as the longest dorsal spine. Color, red.

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[*] See synonymy under Hawaiian Fishes.

Locality: Fanning Islands.

PRISTIPOMATIDÆ.

APHAREUS FURCATUS, (*Lacép.*) *Gthr.* [No. 19239].

Labrus furcatus, LACÉP., Hist. des Poiss., iii, 1803, 424, 477, pl. 21, f. 1.

Caranxamorus sacrestinus, LACÉP., op. cit., v, 1803, 682.

Aphareus cœrulescens, CUV. & VAL., Hist. Nat. des Poiss., vi, 1830, 487, pl. 167*b*.

Aphareus furcatus, GÜNTHER, Cat. Fish., i, 1859, 386; Jour. Mus. Godeff., ii, 1873, Fische der Sudsee, i, 17.

D. $\frac{10}{11}$. A. $\frac{3}{8}$. L. lat. 76. L. trans. $\frac{8}{18}$.

The third dorsal spine is the longest. The last ray of the dorsal and anal fins is three times as long as the preceding rays.* Brown (in spirits). darker above the lateral line; head brownish-blue.

Length, 13 inches.

Locality: Fanning Islands.

LUTJANUS LINEATUS, (*Q. & G.*) *Streets* [No. 19240].

Diacope lineata, QUOY & GAIMARD, Voy. Freyc., Zoöl., 1824, 309.

Diacope striata, CUV. & VAL., Hist. Nat. des Poiss., ii, 1828, 430.

Mesoprion striatus, BLEEKER, Verh. Bat. Gen., xxii, 1849, *Percidæ*, 44.

Mesoprion janthinuropterus, BLEEKER, Nat. Tyds. Ned. Ind., iii, 1852, Celebes, iii, 751.

Mesoprion lineatus, GÜNTHER, Cat. Fish., i, 1859, 193.

D. $\frac{10}{13}$. A. $\frac{3}{8}$. L. lat. 50.

The height of the body equals the length of the head, and is contained 3½ times in the total length; the diameter of the eye is slightly less than one-fifth of the length of the head. Præoperculum finely denticulated; coarser teeth at the angle; a shallow notch above the angle. The fourth and fifth dorsal spines are the longest. Caudal emarginate, Olive, darker above, with oblique brown lines above the lateral line, and longitudinal ones below; no lateral blotch. Dorsal and caudal fins blackish; spinous dorsal with a narrow, deeper black margin; anal and ventrals blackish; a large blackish spot, spreading over the base of the rays, in the axil of the pectoral fin.

Locality: Christmas Island. Very abundant.

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* Günther, in Cat. Fishes, states that it is but twice as long. This is probably a typographical error.

SERRANIDÆ.

EPINEPHELUS URODELUS, (*Forst.*) *Bleeker* [No. 19241].

Perca urodela, Forster, Descr. Anim., ed. Licht., 1844, 221.

Serranus urodelus, Cuv. & Val., Hist. Nat. des Poiss., ii, 1828, 306; vi, 1830, 513.—Bleeker, Nat. Tyds. Ned. Ind., vii, 1854, Kokos-eil., 39.—Günther, Cat. Fish., i, 1859, 122; Jour. Mus. Godeff., ii, 1873, Fische der Sudsee, i, p. 3, pl. 3, f. A.

$$D. \frac{9}{14\text{–}15}. \quad A. \frac{3}{8\text{–}9}.$$

Uniform brown (in spirits). The posterior part of the dorsal and anal, and caudal fins, with white spots; a narrow black margin to the soft dorsal and anal, and a submarginal band of white; caudal with two oblique white lines, converging posteriorly.

Locality: Fanning Islands.

EPINEPHELUS ARGUS, (*Bl. Schn.*) *Bleeker* [No. 19242].

Bodianus guttatus, Bloch, Ausländ. Fische, vii, 1797, pl. 224.—Bloch, Syst. Ichth., ed. Schn., 1801, 330.

Cephalopholis argus, Bloch, Syst. Ichth., ed. Schn., 311, pl. 61.

Serranus myriaster, Cuv. & Val., Hist. Nat. des Poiss., ii, 1828, 365.—Rüppell, Atlas Fische, 1828, 107, pl. 27, f. 1.—Lesson, Voy. Coq. Poiss., 1830, pl. 37.

Serranus argus, Cuv. & Val., op. cit., ii, 1828, 360.—Günther, Cat. Fish., i, 1859, 115.

Serranus guttatus, Peters, Arch. f. Naturg., 1855, i, 235.—Günther, op. cit., i, 1859, 119; Jour. Mus. Godeff., ii, 1873, Fische der Sudsee, i, 5, pl. 4. (non Cuv. & Val.)

$$D. \frac{9}{15\text{–}16}. \quad A. \frac{3}{9}.$$

Brownish-black; head, body and, fins covered with round blue black-edged spots; more or less distinctly-marked transverse bars across the posterior portion of the body; the soft portion of the dorsal, the anal, the pectoral, and the caudal fins with narrow white margins; the upper half of the membrane, between the dorsal spines, light colored.

Locality: Christmas Island.

The name *guttatus* cannot be retained for this species, as an Atlantic species, the *Perca guttata*, Gmelin (=*Epinephelus guttatus*, Goode), has a prior claim to it.

EPINEPHELUS HEXAGONATUS, (*Bl. Schn.*) *Bleeker.* [No. 19243].

Holocentrus hexagonatus, BLOCH, Syst. Ichth., ed. SCHN., 1801, 323.

Serranus hexagonatus, CUV. & VAL., Hist. Nat. des Poiss., ii, 1828, 330; vi, 1830, 516.—RICHARDSON, Voy. Sulph., 1844, 82, pl. 38, f. 1.—BLEEKER, Nat. Tyds. Ned. Ind., vi, 1854, 191.—GUNTHER, Cat. Fish., i, 1859, 140; Jour. Mus. Godeff., ii, 1873, Fische der Sudsee, i, 7, pl. 7.

Serranus foveatus, CUV. & VAL., op. cit., ii, 1828, 329.

Serranus stellans, RICHARDSON, Ann. Nat. Hist., 1842, ix, 23.

Perca hexagonata, FORSTER, Descr. Anim., ed. LICHT., 1844, 189.

$$D. \frac{11}{15\text{–}16}. \quad A. \frac{3}{8}.$$

Brownish; covered all over with hexagonal spots, separated by white lines; four large dark brown blotches on the back along the base of the dorsal fin.

Locality: Christmas Island.

VARIOLA LOUTI, (*Forsk.*) *Bleeker.* [No. 19244.].

Perca louti, FORSKÅL, Descr. Anim., 1775, 40.

Labrus punctatus, LACÉP., Hist. des Poiss., iii, 1803, 377, pl. 17, f. 2.

Bodianus louti, BLOCH, Syst. Ichth., ed. SCHN., 1801, 332.—LACÉP., op. cit., iv, 1803, 286.

Serranus punctulatus, CUV. & VAL., Hist. Nat. des Poiss., ii, 1828, 367; ix, 1833, 435.

Serranus louti, RÜPPELL, Atlas Fische, 1828, 106, pl. 26, f. 2.—GÜNTHER, Cat. Fish., i, 1859, 101; Jour. Mus. Godeff., ii, 1873, Fische der Sudsee, i, 2, pl. 1 (non Val).

Variola longipinna, SWAINSON, Nat. Hist., ii, 1839, 202.

Pseudoserranus louti, KLUNZINGER, Fische d. Roth. Meer, 687.

$$D. \frac{9}{14\text{–}15}. \quad A. \frac{3}{8\text{–}9}.$$

Caudal lobes prolonged; dorsal, anal, and ventral fins produced posteriorly. Reddish (in spirits), covered all over with bluish spots, which are round on the head and fins, and linear on the body; hinder margin of the dorsal, the anal, and the caudal fin light colored.

Locality: Christmas Island.

ECHENEIDIDÆ.

ECHENEIS REMORA, *Linn.*[*] [No. 19245].

Locality: Washington Island. Taken from the body of a captured shark.

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[*] See synonymy under Californian Fishes.

MUGILIDÆ.

MUGIL CRENILABRIS, *Forskål* [No. 19246].

Mugil crenilabris, FORSKÅL, Descr. Anim., 1775, 73.—RÜPPELL, N. W. Fische, 1837, 132.—CUV. & VAL., Hist. Nat. des Poiss., xi, 1836, 123.—GÜNTHER, Cat. Fish., iii, 1861, 458.

Mugil rüppelli, GÜNTHER, Cat. Fish., iii, 1861, 458.

D $4\frac{1}{8}$. A$\frac{3}{9}$. L. lat. 38–40. L. trans. 14.

Height of the body is contained $4\frac{1}{2}$ times in the total length, and the length of the head 5 times in the same. Snout broad, short—less than the diameter of the eye—obtuse; the interorbital space slightly convex, its width being double the vertical diameter of the eye, and contained $2\frac{1}{4}$ times in the length of the head. The upper lip is thick, with short, fleshy fringes; the lower jaw also fringed, and notched at the symphysis; the mandibulary bones do not leave any free space between them below; the præorbital notched anteriorly, and toothed posteriorly; the extremity does not entirely cover the end of the maxillary. Eyes without an adipose membrane. The second dorsal and anal fins scaly; the anterior dorsal spines one-half the length of the head. Caudal forked. The eleventh, the twelfth, and the twenty-third scales of the lateral line correspond to the extremity of the pectoral, and to the origins of the first and second dorsal fins. Sides silvery, darker along the back; a black spot superiorly in the axil of the pectoral.

Length, 6 inches.

Locality: Lagoons of Christmas Island.

MURÆNIDÆ.

MURÆNA PICTA, *Ahl* [No. 19247].

Muræna picta, J. N. AHL, de *Muræn. et Ophichth.*, in Thunberg's Dissert., iii, 1793, 6, pl. 2, f. 2.—PLAYFAIR & GÜNTHER, Fish. Zanz., 1866, 126.—GÜNTHER, Cat. Fish., viii, 1870, 116.

Gymnothorax pictus, BLOCH, Syst. Ichth., ed. SCHN., 1801, 529.—BLEEKER, Atl. Ichth., iv, 1864, 87, pl. 170, f. 3, 4, pl. 172, f. 3, pl. 173, f. 1, pl. 189, f. 3.—KNER, Fisch. Novara Exped., 1869, 384.

Murænophis pantherina, LACÉPÈDE, Hist. des Poiss., v, 1803, 628, 641, 643.

Muræna variagata, QUOY & GAIMARD, Voy. Uran., Poiss., 1824, pl. 52, f. 1.

Muræna lita, RICHARDSON, Zoöl. Voy. Ereb. & Terr., Fish., 1846, 84.—BLEEKER, Nat. Tyds. Ned. Ind., iii, 1852, 294; x, 1856, 283; Verh. Bat. Gen., xxv, 1853, *Muræn.*, 47.

Muræna sidera, RICHARDSON, op. cit., 85, pl. 48, f. 1–5.

Muræna pfeifferi, **Bleeker**, Nat. Tyds. Ned. Ind., v, 1853, 173; Verh. Bat. Gen., xxv, 1853, *Muræn.*, 72.

Sidera pfeifferi, **Kaup**, Cat. Apod. Fish., 1856, 71.

Sidera pantherina, **Kaup**, op. cit., 1856, 71.

Gymnothorax pantherinus, **Bleeker**, Ned. Tydschr. Dierk., i, 1863, 152.

Locality: Palmyra Island. The collection contains many specimens, illustrating all the variations of color-markings of this variable species. All the teeth, except the anterior mandibulary, are uniserial in their arrangement. One specimen, six inches long, presents all the details of coloration of *Muræna polyophthalma*, but differs from it in its dentition.

GALEORHINIDÆ.

CARCHARIAS MELANOPTERUS, *Q. & G.* [No. 19248].

Carcharias melanopterus, **Quoy & Gaimard**, Voy. Uran. Zoöl., 1824, 194, pl. 43, f. 1-2.—**Rüppell**, N. W. Fische, 1837, 63.—**Günther**, Cat. Fish., viii, 1870, 369.

Carcharias (Prionodon) melanopterus, **Müller & Henle**, 43, pl. 19, f. 5.—**Bleeker**, Verh. Bat. Gen., xxiv, 1852, *Plag.*, 33.—**Dumeril**, Elasmobr., 365.

Carcharias (Prionace) melanopterus, **Cantor**, Mal. Fish., 400.

Carcharias (Prionodon) henlei, **Bleeker**, Nat. Tyds. Ned. Ind., iv, 1853, 507.

Carcharias (Prionodon) brachyrhynchus, **Bleeker**, Act. Soc. Sc. Indo-Neerl., vi, 1859, 206.—**Dumeril**, Elasmobr., 364.

Localities: Christmas and Washington Islands. Young and fœtus. Gray, with all the fins of the body tipped with black.

IV.—*Fishes from the Samoan Islands, collected by A. B. Steinberger.*

OSTRACIONTIDÆ.

OSTRACION PUNCTATUS, *Bl. Schn.* [No. 15130].

Ostracion pointillé, **Lacépède**, Hist. des Poiss., i, 1798, 442, 445, pl. 21, f. 1.

Ostracion punctatus, **Bloch**, Syst. Ichth., ed. **Schn.**, 1801, 501.—**Jenyns**, Zoöl. Beagle, Fish., 1842, 158.—**Bleeker**, Nat. Tyds. Ned. Ind., xi, 1856, 108; Atl. Ichth., v, 1865, 39, pl. 202, *Ostrac.*, pl. 2, f. 4.—**Hollard**, Ann. Sc. Nat., vii, 1857, 167.—**Günther**, Cat. Fish., viii, 1870, 261.—**Playfair & Günther**, Fish. Zanz., 1866, 130.

Ostracion lentiginosus, **Bloch**, Syst. Ichth., ed. **Schn.**, 1801, 501.

Ostracion meleagris, **Shaw**, Gen. Zoöl., v, 1804, 428, pl. 172; Nat. Misc., 7, pl. 253.

The entire body covered with small white spots, which are confluent into undulating lines on the under surface of the body, and under the eyes.

BALISTIDÆ.

BALISTES ACULEATUS, *Linn.** [No. 15138].

Young specimen. Two and a half inches long.

GOBIIDÆ.

BRACHYELEOTRIS CYANOSTIGMA, *Blkr.*† [No. 15115].

Similar in every respect, even to the presence of the rudimentary spines on the præoperculum, to those described from the Hawaiian Islands.

GOBIUS ECHINOCEPHALUS, *Rüpp.* [No. 15113].

Gobius echinocephalus, Rüppell, Alt. Fische, 1828, 136; N. W. Fische, 1837, 137, 138.—Cuv. & Val., Hist. Nat. des Poiss., xii, 1837, 134.—Günther, Cat. Fish., iii, 1861, 34.—Klunzinger, Verh. zoöl.-bot. Gesel., xxi, 1871, 475.

Gobius amiciensis, Cuv. & Val., op. cit., xii, 1837, 135.—Günther, op. cit., iii, 1861, 35.—Kner & Steindachner, Sitz. d. k. Ak. d. Wissen., Math.-Naturwissen. Classe, liv, i, 1866, 367.

D. $6\frac{1}{10}$. A. $\frac{1}{9}$. L. lat. 23–24. L. trans. 8.

Height of the body one-fourth of the total length. Head as high as long, very obtuse in front; cleft of mouth nearly vertical. The outer series of teeth in both jaws enlarged; in the lower jaw in front, on either side of the symphysis, and behind the other teeth of the jaw, is a large canine tooth, curved backward. Head and vertex, to the commencement of the first dorsal fin, naked; cheeks swollen, and together with the under surface of the head, covered with small warts and short cirri. Gill-openings narrow, of the same length as the base of the pectoral fin. Ventrals subcircular; caudal rounded. Body light brown; head somewhat lighter; fins dark brown.

GOBIODON CITRINUS, (*Rüpp.*) *Gthr.* [No. 15114].

Gobius citrinus, Rüppell, N. W. Fische, 1837, 139, pl. 32, f. 4.

Gobiodon citrinus, Günther, Cat. Fish., iii, 1861, 87.—Klunzinger, Verh. zoöl.-bot. Gesel., xxi, 1871, 480.

Head and body compressed; head rounded, very obtuse in front. Scales none. No canine teeth. Yellow, with a blue black-edged streak along the base of the dorsal and anal fins; two similar, but vertical, streaks through and below the eye; another in front of the pectoral fin, commencing above, and terminating on the base. The first dorsal with a narrow, black margin. All the specimens were enveloped in a thick mucous covering, which completely obscured the markings of the body.

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* See synonymy under Fishes from Fanning Islands.

† See synonymy under Hawaiian Fishes.

GOBIODON CERAMENSIS, (*Blkr.*) *Gthr.* [No. 19250].

Gobius ceramensis, BLEEKER, Nat. Tyds. Ned. Ind., iii, 1852, Ceram, ii, 704.
Gobiodon ceramensis, GÜNTHER, Cat. Fish., iii, 1861, 88.

D. $6\frac{1}{10}$. A. $\frac{1}{8}$.

Scales none. Height of the body is contained $3\frac{1}{2}$ times in the total length, and the length of the head $4\frac{1}{2}$ times in the same. Head and body compressed, the former as high as long; eyes close together; the profile of the snout descends nearly vertically from between the eyes. Lower jaw with canine teeth in front, behind the outer band. Caudal rounded. Brown, with blackish fins.

SCORPÆNIDÆ.

SEBASTOPSIS GUAMENSIS, (*Q. & G.*) [Nos. 15106, 15136].

Scorpæna guamensis, QUOY & GAIMARD, Voy. Uran. Zoöl., 1824, 326.—GÜNTHER, Jour. Mus. Godeffr., ii, 1874, Fische der Sudsee, i, 74, pl. 56, f. B.
Scorpæna rubropunctata, CUV. & VAL., Hist. Nat. des Poiss., iv, 1829, 324.
Sebastes minutus, CUV. & VAL., op. cit., iv, 1829, 348.—GÜNTHER, Cat. Fish., ii, 1860, 106.
Scorpæna chilioprista, RÜPPELL, N. W. Fische, 1837, 107, pl. 27, f. 3.—GÜNTHER, Cat. Fish., ii, 1860, 121.
Scorpæna polylepis, BLEEKER, Nat. Tyds. Ned. Ind., ii, 1851, 173.
Sebastes polylepis, GÜNTHER, Cat. Fish., ii, 1860, 106.

D. 11–$12\frac{1}{9}$. A. $\frac{3}{5}$. L. lat. 42.

Height of the body is one-third of the total length (without caudal), and the length of the head is about two-fifths of the same. No teeth on the palatine bones. Occiput scaly; scales extending to the groove between the eyes. Diameter of the eye equals the length of the snout, and is twice the width of the interorbital space. The end of the maxilla extends beyond the vertical from the center of the eye. Eleven simple rays in the pectoral fin. The fifth to the eighth dorsal spines the longest, more than one-third of the length of the head. No cutaneous appendages. Light brown, marbled with dark brown; a large, rounded, blackish spot on the operculum.

POMACENTRIDÆ.

DASCYLLUS ARUANUS, (*L.*) *C. & V.* [No. 15104].

Chætodon aruanus, Linn., Syst. Nat., i, 1766, 464.—Bloch, Ausländ. Fische, iii, 1787, 62, pl. 198, f. 2.—Bloch, Syst. Ichth., ed. Schn., 1801, 220.—Shaw, Gen. Zoöl., iv, 1803, 348.
Chætodon abu dafur, Forskål, Descr. Anim., 1775, 15.
Lutjanus aruanus, Lacép., Hist. des Poiss., iv, 1803, 720.
Pomacentrus aruanus, Rüppell, Atl. Fische, 1828, 39.
Dascyllus aruanus, Cuv. & Val., Hist. Nat. des Poiss., v, 1830, 434.—Günther, Cat. Fish., iv, 1862, 12.
Chætodon araneus, Bennett, Fish of Ceylon, 1837, pl. 17.
Tetradrachmum arcuatum, Cant., Mal. Fish., 241.

Body with three black cross-bands, extending on the dorsal and anal fins; the first descends obliquely from the commencement of the spinous dorsal, through the eye, to the chin, leaving a round, greyish space between the eyes; the second band is bowed, and extends from the middle of the spinous dorsal to the ventral fins; the third from the posterior part of the soft dorsal to the anal fin. Ventrals black; caudal white. Anus black.

CHRÒMIS LEPIDURUS, (*C. & V.*) *Streets* [No. 15116].

Heliastes lepidurus, Cuv. & Val., Hist. Nat. des Poiss., v, 1830, 498.—Günther, Cat. Fish., iv, 1862, 63.
Heliastes frenatus, Cuv. & Val., op. cit., v, 1830, 498.—Günther, op. cit., iv, 1862, 62.

D. $\frac{12}{10}$. A $\frac{2}{10}$. L. lat. 27. L. trans. $\frac{1\text{-}2}{8}$.

Height of the body is one-half of the total length (without caudal), and the length of the head is contained about three times in the same. But one distinct series of conical teeth. The diameter of the eye longer than the snout, and is contained about two and two-thirds times in the length of the head. Caudal fin forked, and its basal half scaly. Cerulean; silvery on the breast and lower part of the head; a bluish-white streak from the eye to the snout; fins minutely punctate; pectoral yellowish, a black spot in the axil above.

One specimen, larger than the others (1.20 inches), of a brownish-metallic luster, with some scattered blue spots on the sides.

GLYPHIDODON ANTJERIUS, (*C. & V.*) *Gthr.* [No. 15117].

Glyphisodon antjerius, Cuv. & Val., Hist. Nat. des Poiss., v, 1830, 481.—Bleeker Nat. Tyds. Ned. Ind., viii, 1855, Kokos, iv, 454.

Glyphisodon biocellatus, Cuv. & Val., op. cit., v, 1830, 482.—Quoy & Gaim., Voy Uran. Zoöl., 1824, 389.—Bleeker, op. cit., viii, 1855, Sumatra, ii, 286.—Lesson, Voy. Coq. Zoöl., Poiss., 1830, 188.

Glyphisodon zonatus, Cuv. & Val., op. cit., v, 1830, 483.

Glyphisodon punctulatus, Cuv. & Val., op. cit., v, 1830, 484.

Glyphidodon antjerius, Günther, Cat. Fish., iv, 1862, 50.

D. $\frac{13}{13}$. A. $\frac{2}{13}$. L. lat. 26.

Var. γ of Günther. Ground-color brownish, every scale on the body with one or more blue spots; similar spots on the fins; a blue streak from the middle of the snout, where it joins with its fellow of the opposite side, along the upper margin of the eye to the base of the anterior portion of the spinous dorsal; a short streak along the upper part of the eye, and one through the eye below the pupil to the upper jaw; a streak around the lower margin of the orbit, and still another below this on the cheek; a large, black, blue-edged ocellus on the posterior spines of the dorsal fin, extending on the back; a similar ocellus, but smaller, on the base of the posterior rays of the soft portion of the dorsal, extending on the upper part of the caudal peduncle.

Var. δ. A blue transverse band from the sixth dorsal spine to in front of the anus; the blue streak from the snout, along the upper margin of the eye, to the base of the dorsal is absent. In other respects similar to var. γ.

GLYPHIDODON UNIOCELLATUS, (*Q. & G.*) *Gthr.* [No. 15112].

Glyphisodon uniocellatus, Quoy & Gaimard, Voy. Uran. Zöol., 1824, 393, pl. 64, f. 4.—Cuv. & Val., Hist. Nat. des Poiss., v, 1830, 481.

Glyphidodon uniocellatus, Günther, Cat. Fish., iv, 1862, 52.

Glyphidodon assimilis, Günther, op. cit., iv, 1862, p. 52.

D. $\frac{13}{12}$. A. $\frac{3}{13}$. L. lat. 28. L. trans. $\frac{2}{9}$.

Height of the body is contained 2½ times in the total length (without caudal). Diameter of the eye greater than the width of the interorbital space, or than the length of the snout. The greatest width of the præorbital equals one-half the diameter of the eye. Teeth very narrow. Caudal fin subtruncated; lobes rounded. Beautiful azure-blue (in spirits), with round yellow spots scattered over the sides of the body; fewer than one to every scale; a dark band along the middle of the nape of the neck and of the forehead; another from the commencement of the lateral line, through the eye, to the snout, where it meets its fellow of the opposite side; the lower side of the head brownish; a round black spot on the base of the soft dorsal, extending from the sixth to the eleventh ray.

Length, 1.50 inches.

GLYPHIDODON BONANG, (*Blkr.*) *Gthr.* [No. 15114].

Glyphisodon bonang, BLEEKER, Nat. Tyds. Ned. Ind., 1852, Sumatra, i, 582.
Glyphidodon bonang, GÜNTHER, Cat. Fish., iv, 1862, 45.

D. $\frac{12}{15-16}$. A. $\frac{2}{13}$. L. lat. 29.

Immature.—Height of the body is contained nearly twice in the total length (without caudal). Infraorbitals scaly. Uniform brown, with some scattered bluish spots; a black spot, blue-edged in smaller specimens, on the posterior dorsal rays.

LABRIDÆ.

JULIS SCHWANEFELDI, *Blkr.* [No. 15133].

Julis schwanefeldi, BLEEKER, Nat. Tyds. Ned. Ind., iv, 1853, Sumatra, ii, 288; Atl. Ichth., i, 1862, 95, pl. 33, f. 7.—GÜNTHER, Cat. Fish., iv, 1862, 191.

Body with six brownish cross-bands; two reddish streaks from behind the eye to the margin of the operculum, and one in front of the eye to the snout. Two deep blue spots on the dorsal fin, one on the spinous dorsal between the first and the third spines; the other on the soft portion between the first and the third rays; four or five spots of like character below the soft dorsal, on the posterior cross-bands of the sides.

STETHOJULIS ALBOVITTATA, (*Lacép.*) *Gthr.* [No. 15139].

Labrus albovittatus, LACÉP., Hist. des Poiss., iii, 1803, 443, 509.
Julis balteatus, QUOY & GAIMARD, Voy. Uran. Zoöl., 1824, 267, pl. 56, f. 1.—CUV. & VAL., Hist. Nat. des Poiss., xiii, 1839, 475.—BLEEKER, Nat. Tyds. Ned. Ind. ii, 1851, Banda, i, 253.
Stethojulis albovittata, GÜNTHER, Ann. & Mag. Nat. Hist., 1861, viii, 386; Cat. Fish., iv, 1862, 141.—BLEEKER, Atl. Ichth., i, 1862, 132, pl. 44, f. 5.

Four narrow, longitudinal bluish or whitish bands on the body; the upper commences at the upper margin of the orbit, and runs along the base of the dorsal fin; the second proceeds from the upper surface of the snout, through the eye, and terminates under the anterior part of the lateral line; the third from the side of the snout, below the eye, through the angle of the operculum, to the middle of the base of the caudal fin; the fourth begins on the under part of the lower jaw, crosses the cheek in a curve to the sub-operculum, ascends along the gill-opening to the base of the pectoral fin, where it is interrupted; commences again in the axil of pectoral, and terminates on the lower part of the base of the caudal; it is curved on the body.

ACANTHURIDÆ.

ACANTHURUS LINEATUS, (*Gm.*) *Bl. Schn.* [No. 15131].

Chætodon lineatus, GMÉLIN, Syst. Nat., i, 1788, 1246.
Acanthurus lineatus, BLOCH, Syst. Ichth., ed. SCHN., 1801, 214, pl. 49.—CUV. & VAL., Hist. Nat. des Poiss., x, 1835, 223.—GÜNTHER, Cat. Fish., iii, 1861, 333; Jour Mus. Godeffr., ii, 1875, Fische der Sudsee, i, 111, pl. 70.
Acanthurus vittatus, BENNETT, Fish of Ceylon, 1837, pl. 2.

CHILODIPTERIDÆ.

APOGON AURITUS, *C. & V.** [No. 15134].

Densely sprinkled with brown; a black, white-edged spot on the operculum.

APOGON FASCIATUS, (*White*) *Q. & G.* [No. 15108].

Mullus fasciatus, WHITE, Jour. Voy. New South Wales, 1790, 268, pl. 1.
Apogon novemfasciatus, CUV. & VAL., Hist. Nat. des Poiss., ii, 1829, 154.
Apogon fasciatus, QUOY & GAIMARD, Voy. Freyc. Zoöl., 1824, 344.—GÜNTHER, Cat. Fish., i, 1859, 241; Jour. Mus. Godeffr., ii, 1873, Fische der Sudsee, i, 19, pl. 20, f. A, B.
Apogon aroubiensis, Homb. & Jacquin., Voy. au Pôle Sud, Poiss., 1853, 31, pl. 1, f. 1.

D. $7\frac{1}{9}$. A. $\frac{2}{8}$. L. lat. 25. L. trans. 8.

Ground color silvery, with four longitudinal dark brown bands along the sides of the body; the first short, along the back; the second, third, and fourth from the snout to the caudal; the second and fourth converging on the caudal. Spinous dorsal blackish; a black band across the base of the second dorsal and anal.

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* See synonymy under Hawaiian Fishes.

APOGON GRÆFFI, *Günther* [No. 15110].

Apogon græffi, GÜNTHER, Jour. Mus. Godeffr., ii, 1873, Fische der Sudsee, i, 22, pl. 20, f. E.

D. $6\frac{1}{9}$. A. $\frac{2}{9}$. L. lat. 24. L. trans. 8.

Greatest height of the body slightly more than one-third of the total length, and is contained $2\frac{1}{5}$ times in the same without the caudal. Diameter of the eye twice the length of the snout, and two-fifths of the length of the head. None of the bones of the head serrated. The end of the upper maxilla reaches nearly to the vertical from the center of the eye. The middle spines of the first dorsal prolonged, thread-like; the first very long, reaching, when laid back, to the summit of the second dorsal; second dorsal lower than the body. Silvery on the side of the head and breast; head dotted; the dots under a lens are seen to be stellate; a row of minute dots along the dorsal line of the body. The dorsal fins minutely punctate; the first darker than the second.

Length, two inches.

[No. 19249.] Another specimen of the same species in which the second dorsal spine is less prolonged, and the back and sides are covered with stellate spots; a brown spot on each side of the base of the caudal fin. In other respects similar to the above.

BERYCIDÆ.

HOLOCENTRUM DIADEMA, *Lacép.* [Nos. 15109, 15132].

Holocentrum diadema, LACÉP., Hist. des Poiss., iv, 1803, 372, 374; iii, 1803, pl. 32, f. 3.—RUPPELL, Atl. Fisches, 1828, 84, pl. 22, f. 2.—CUV. & VAL., Hist. Nat. des Poiss., iii, 1829, 213.—LESSON, Voy. Coq. Zoöl., 1830, ii, 220, pl. 25, f. 2.—GÜNTHER, Cat. Fish., i, 1859, 42; Jour. Mus. Godeffr., ii, 1874, Fische der Sudsee, i, 97.

Perca pulchella, BENNETT, Zoöl. Jour., iii, 377, pl. 9, f. 3.

Red, with nine longitudinal silvery bands along the side; spinous dorsal blackish, with a white, curved band along the middle, here and there interrupted; the upper edge of the membrane between the spines white; the space between the second spine and first ray of the anal fin clouded.

MUGILIDÆ.

AGONOSTOMA DORSALIS, n. sp. [No. 15111]

D. $4\frac{1}{8}$. A. $\frac{3}{9}$.

The height of the body is one-fifth of the total length, and the length of the head is contained four and a half times in the same. Small teeth in the upper jaw; no teeth in the lower jaw, on the vomer, or palatines. Eyes without adipose membrane. Upper lip thin. The end of the maxilla extends to the vertical from the front margin of the orbit. Interorbital space flat. Præorbital serrated anteriorly and below. The anterior dorsal commences midway between the end of the snout and the base of the caudal fin.

Silvery, with a metallic luster along the back; the base of the second dorsal fin black.

Length, 1.50 inches.

CRUSTACEA.

MAIIDÆ.

LIBININÆ.

LIBINIA SEMIZONALE, *Streets*. n. sp.

Carapace pyriform; regions distinctly marked; surface shining, uneven, and shortly pubescent in places; pubescence more marked anteriorly; spinous. The arrangement of the spines is as follows:—eight in the median line of the body, placed, four on the gastric region, one on the genital, two on the cardiac, and one on the intestinal; on the anterior portion of the gastric region are two other spines, arranged transversely, in a line with the first one of the longitudinal series; so that all the spines of this region form the letter T; on the hepatic region are two spines, placed one above the other; immediately beneath these, on the lateral line, is another (on the left side there were two); the spines on the hepatic region, with those on the lateral line and the transverse row on the gastric region, taken together form a semicircle across the anterior portion of the carapace; sub-hepatic spines two, the anterior of which is the larger; there is another under the lateral line posterior to a sulcus separating the hepatic and branchial regions; four on the middle of the branchial region, inclosing a regular diamond-shaped space; another small spine on the upper part of the same region, on the edge of the depression separating it from the cardiac region; finally, there is an elevation, or a faint trace of a spine, on the posterior part of the branchial region.

Rostrum prominent, broad; broadest at the base, and slightly converging to the points; directed upward at an angle with the body; convex above and densely pubescent; the entire under surface deeply excavated; its apex obliquely truncated above, producing, by reason of its hollow under surface, two points, the outer surfaces of which are straight and nearly parallel, while the inner margins are sloping, and converge to the median line of the rostrum; along the inner edge of the tips is arranged a row of long, stiff hairs; sides of the rostrum slightly concave, and at the base of the upper surface is a broad, shallow depression, which narrows to the apex of the bifurcation. A prominent spine projects over the inner canthus of the eye; the outer angle of the orbit not produced; a deep sulcus on the superior border of the orbit, which is bridged over at the top by a small spine, which arises from the base of the prominent spine at the inner canthus; on the inferior border of the orbit is another fissure, from the bottom of which is a strong spine, springing from the base of the outer angle, and projecting inward and downward under the basal article of the external antenna.

External antennæ hidden under the rostrum; the basal article robust, longer than broad, forming a part of the inferior border of the orbit; the external angle produced in the form of a tooth; the remaining articles slender and cylindrical; a row of long stiff hairs along the entire inner side of the antennæ.

Legs slender, smooth, and shining like the carapace; the joints cylindrical, with the exception of the fourth, which is depressed, and marked by a longitudinal depression above and below; the tarsi are tapering, and armed with long corneous points; the anterior pair of feet only very slightly more robust than the following; the hands much compressed; fingers slender, white at the tips, with their cutting edges approximating along nearly their entire length.

Abdomen composed of seven segments; on the center of the first segment there is a rather prominent tubercle; the terminal segment is somewhat triangular, with a rounded apex.

The breadth of the carapace is exactly three-fourths of the length. Length, including the rostrum, 2.70 inches; breadth, 2.03; the anterior pair of legs a little longer than the body; the length of the second pair equals that of the first; the length of the hand and carpus of the first pair comprise one-half of their entire length.

Locality: Lower California.

The arrangement of the spines on the surface of the carapace, and the absence of the lateral row of spines are sufficient to distinguish this species from all others belonging to the genus.

CANCRIDÆ.

XANTHINÆ.

ATERGATIS LIMBATUS, (*Edw.*) *Dana.*

Atergatis limbatus, DANA, U. S. Expl. Exped. Crust., i, 157.—HELLER, Crust. Novara Exped., 8.

Xantho granulosus, RÜPPELL, Krabben des rothen Meeres, 24, pl. 5, f. 3.

Ægle granulosus, DE HAAN, Faun. Japon., 17.

Cancer limbatus, EDWARDS, Hist. Nat. des Crust., i, 377, pl. 16, f. 1.

Locality: Hawaiian Islands.

CHLORODINÆ.

ETISUS LEVIMANUS, *Randall.*

Etisus levimanus, RANDALL, Jour. Acad. Nat. Sci. Philadelphia, viii, 115.—DANA, U. S. Expl. Exped. Crust., i, 185, pl. 10, f. 1.

Locality: Hawaiian Islands.

CHLORODIUS UNGULATUS, *Edwards.*

Chlorodius ungulatus, EDWARDS, Hist. Nat. des Crust., i—DANA, U. S. Expl. Exped. Crust., i, 205, pl. xi, f. 8.

Locality: Hawaiian Islands.

CHLORODIUS SANGUINEUS, *Edwards.*

Chlorodius sanguineus, EDWARDS, Hist. Nat. des Crust., i, 402—DANA, U. S. Expl. Exped. Crust., i, 207, pl. xi, f. 11.—HELLER, Crust., Novara Exped., 18.

Chlorodius exaratus, STIMPSON, Proc. Acad. Nat. Sci. Philadelphia, 1858, 34.—EDWARDS, Hist. Nat. des Crust., i, 402.—DANA, U. S. Expl. Exped. Crust., i, 208.

Chlorodius inæqualis, AUDOUIN, Explic. des. pl. de Savigny.—SAVIGNY, Desc. de l'Egypte. Crust., pl. v, f. 7.

Chlorodius Edwardsii, HELLER, Sitzungsberichte der Wiener Akademie, Bd., xliii, 336.

Cancer (*Xantho*) *lividus*, DE HAAN, Faun. Japon., 48, pl. xiii, f. 6.

Cancer (*Xantho*) *affinis*, DE HAAN, l. c. 48, pl. xiii, f. 8.

Locality: Hawaiian Islands.

ERIPHIDÆ.

ERIPHINÆ.

TRAPEZIA MACULATA, (*M'Leay*) *Dana*.

Trapezia maculata DANA, U. S. Expl. Exped. Crust., i, 256, pl. xv, f. 4.—STIMPSON, Proc. Acad. Nat. Sci. Philadelphia, 1858, 37; Ann. Lyc. Nat. Hist. N. Y., vii, 219.

Trapezia maculatus, KRAUSS, Südaf. Crust., 36.

Trapezia guttata, RÜPPELL, Krabben des rothen Meeres, 27.—HELLER, Crust., Novara Exped., 25.

Trapezia tigrina, EYDOUX & SOULEYET, Voy. de la Bonita, pl. ii, f. 4.

Grapsillus maculatus, M'LEAY, Crust. of Smith's Illust. Zoöl. S. Africa, 67.

Locality: Hawaiian Islands.

PORTUNIDÆ.

LUPINÆ.

NEPTUNUS SANGUINOLENTUS, (*Herbst*) *De Haan*.

Neptunus sanguinolentus, DE HAAN, Faun. Japon. Crust., 38.—ALPH. M. EDWARDS, Arch. du Mus. d'Hist. Nat. de Paris, 1860, x, 319.—HELLER, Crust. Novara Exped., 26.

Lupa sanguinolenta, DESMAREST, Crust., 99.—M. EDW., Hist. Nat. des Crust., i, 451; et Cuv. Règn. Anim. pl. x, f. 1.—DANA, U. S. Expl. Exped. Crust., i, 271.—STIMPSON, Proc. Acad. Nat. Sci. Phila., 1858, 38.

Portunus sanguinolentus, FABR., Suppl. Entom. syst., 365.—LATR., Encyclop. Method, x, 190.

Cancer palagicus, FABR., Mant. Ins., i, 318.—LIN., Syst. Nat., ed. Gmelin.

Cancer sanguinolentus, HERBST, Krabben und Krebse, i, 161, pl. 8, f. 56, 57.

Locality: Hawaiian Islands.

THALAMITA ADMETE, (*Herbst*) *Latr*.

Thalamita admete, LATR., Règn. Anim. de Cuvier, 2 ed., iv, 33.—M. EDWARDS, Hist. Nat. des Crust., i, 459; et Règn. Anim. de Cuv. Atlas Crust., pl. ix, f. 2.—DANA, U. S. Expl. Exped. Crust., i, 281, pl. xvii, f. 5.—ALPH. M. EDWARDS, Arch. du Mus., 1860, x, 356.—HELLER, Crust. Novara Exped., 28.—STIMPSON, Proc. Acad. Nat. Sci. Phila., 1858, 39.

Portunus admete, LATR., Nouv. Dict. d'Hist. Nat., xxviii, 44.

Cancer admetus, HERBST, Krabben und Krebse, pl. 57, f. 1.

Locality: Hawaiian Islands.

THALAMITA INTEGRA, *Dana.*

Thalamita integra, DANA, U. S. Expl. Exped. Crust., i, 281, pl. xvii, f. 6.—ALPH. M. EDWARDS, Arch. du Mus., x. 356.—STIMPSON, Proc. Acad. Nat. Sci. Phila. 1858, 39.

Locality: Hawaiian Islands.

The resemblance between the two preceding species of *Thalamita* is very close, and at first sight they may be very readily confounded; yet their differences are well marked and constant. In collecting them, the two kinds were thrown together as belonging to the same species; but when their specific characters were once recognized, there was no difficulty in separating the one from the other. The *integra* is much more abundant in the harbor of Honolulu, than the *admete.* In a lot of twenty-seven, collected from that locality, there were twenty-two of the former and five of the latter.

The following are the chief points of difference between the two species. In *integra* there are two spines on the superior edge of the hand; one, sharp-pointed, is situated on the middle of the border, and its base is continuous with an abrupt ridge running to the base of the hand; the second spine, usually blunt and eroded in the adult, but sharp-pointed in the young, is placed on the extreme distal angle of the upper border, and is also continuous by its base with another abrupt ridge, which extends toward the middle of the hand, but which is interrupted at the base of the first spine. The position of this second spine is a point of great diagnostic importance. Exterior to the superior edge is another spine, more or less worn down, the base of which coalesces with a rounded ridge, running toward the base of the hand; in front of and a little superior to the last, at the angle, is a slight prominence; there is a fourth spine at the base of the hand near the carpal articulation. The surface of the hand is smooth.

In *admete* there are likewise two spines on the superior border of the hand; but their arrangement is somewhat different. The outer one is not placed on the extreme distal angle of the hand, but is posterior to it; and the ridge which extends to the base of the hand, from the spine on the middle of the border, is serrated. The other spines on the hands have exactly the same arrangement as in *integra.* The superior surface of the hand is sparsely and coarsely granular; the inferior border finely granular.

The carapace furnishes some additional characters. In *integra* the front is not on a straight line throughout its entire length, in the majority of cases. The crest of the base of the outer antennæ is not denticulated. Dana states that the "median region is not crossed by any raised lines;" while his figure shows them. They were present in all the specimens examined by me, and in this respect the species does not differ from *admete*. Anterior to the line crossing the middle region, and on either side of the median line of the body are two slight prominences; posterior to the median line is another, "which reaches to the posterior tooth on either side." The antero-lateral margin is four-toothed as in *admete;* only occasionally do we find a fifth tooth developed. The carapace is more convex.

The manner in which the carapace of the *admete* differs from the above description is briefly, as follows: The lines on the surface of the carapace are more prominent; in place of the two prominences anterior to the line crossing the median region of the body are two short serrated lines; and there are, in addition to these two, others of the same character, anterior to the extremities of the median transverse line. The carapace is more compressed, and "the crest of the base of the outer antennæ is evenly and short denticulated."

THALAMITA PYRMNA, (*Herbst*) *M. Edw.*

Thalamita prymna, M. EDWARDS, Hist. Nat. des Crust., i, 461.—DE HAHN, Faun. Japon. Crust., 43, pl. xii, f. 2.—ALPH. M EDWARDS, Arch. du Mus. d'Hist. Nat., 1860, x, 360.

Thalamita crassimana, DANA, U. S. Expl. Exped. Crust., i, 284, pl. xvii, f. 9.—STIMPSON, Proc. Acad. Nat. Sci. Phila., 1858, 39.

Portunus prymna, LATREILLE, Nouv. Dict. d'Hist. Nat., xxviii, 44.

Cancer prymna, HERBST, Krabben und Krebse, pl. lvii, f. 2.

Locality: Palmyra Island, North Pacific.

The crest of the base of the outer antennæ differs somewhat from the description of it given by Dana. This distinguished carcinologist states, that the crest is irregularly divided. On the left side the crest bears three teeth; two of which are sharp and prominent, and the third is quite small. The latter is situated at the base of the inner prominent tooth. On the right side there have been three prominent teeth, but their apices are broken off, and the crest has the appearance of being "irregularly divided," as is shown in Dana's figure. The anterior margin of the arm is armed with four spines; the fourth—counting them in the same precedence as in the two species of the genus discussed above—

at the outer angle, is short and sometimes broken off. In every other respect the specimens examined are identical with the description and figure given by Dana. The fourth tooth on the antero-lateral margin is smaller than the rest, but the difference is not so great as is pictured in the figure.

ACHELOUS GRANULATUS, (*M. Edw.*) *Alph. M. Edwards.*

Achelous granulatus, ALPH. M. EDWARDS, Arch. du Mus. d'Hist. Nat. de Paris, 1860, x, 344.

Amphitrite speciosa, DANA, U. S. Expl. Exped. Crust., i, 276, pl. xvii, f. 1.—STIMPSON, Proc. Acad. Nat. Sci. Phila., 1858, 39.

Amphitrite gladiator, DE HAÄN, Faun. Japon. Crust., 65, pl. xviii, f. 1 (et non pl. 1).

Lupa granulata, M. EDWARDS, Hist. Nat. des Crust., i, 454.

Locality: Fanning Group of Islands, North Pacific.

CARCINUS MŒNAS, (*Linn.*) *Leach.*

Carcinus mœnas, LEACH, Melac. Podophth. Brit., pl. v; Edinb. Encyclop., vii, 429; Trans. Linn. Soc., xi, 314; Encyclop. Britann. Suppl., i, 410.—AUDOUIN, dans l'ouvrage de Savigny, Egypte. Crust., pl. iv, f. 6.—M. EDWARDS, Hist. Nat. des Crust., i, 434.—GOULD, Report on the Invertebrata of Massachusetts, 321.—DE KAY, Nat. Hist. N. Y., Crust., 8, pl. v, f. 5–6.—BELL, British. Crust., 76.—ALPH. M. EDWARDS, Arch. du Mus. d'Hist. Nat. de Paris, 1860, x, 391.—HELLER, Crust. Novara Exped., 30.

Carcinus granulatus, SMITH, Report of Commissioner of Fish and Fisheries, 312, 547.

Portunus mœnas, LEACH, Edinb. Encyclop., vii, 390.—COSTA, Fauna del regno di Napoli, Crust. g. Portuno., 7.

Cancer granulatus, SAY, Jour. Acad. Nat. Sci. Phila., 1817, i, 61.

Cancer mœnas, LINN., Syst. Nat., xii, i, 1043.—PENNANT, Brit. Zoöl., iv, 3, pl. iii, f. 3.—BASTER, op. subst. ii, 19, pl. ii.—HERBST, Krabben und Krebse, pl. vii, f. 46.—FABRICIUS, Entom. Syst. Suppl., 11, 450; 41, 334, 3.—LATREILLE, Gen. Crust. et Insect., 1, 30, 2.

Locality: Hawaiian Islands.

This is the first well-authenticated instance, to my knowledge, where the genus *Carcinus* is recorded as coming from the Pacific regions. In the museum of the Academy of Natural Sciences of Philadelphia, there is a specimen labeled from Australia, with an interrogation mark. It is probable that all the specimens obtained from this region have only been stragglers from the Atlantic. The Hawaiian Islands, where the last came from, have been thoroughly ransacked by collectors for this kind of life; and, had the species been common, it could not have well eluded the search so long. That it is a wandering crab, almost cosmopolitan in its range, is seen by glancing at the extent of country that is embraced in its wanderings. It is common on the coasts of France and England; it is found in the Baltic Sea, along the shores of the Mediterranean, and in the Red Sea. It is by no means an uncommon crab along the whole extent of the eastern coast of the United States, and Heller records it as coming from the shores of Brazil.

I am able to detect some differences, amounting probably to a slight geographical variation, among the specimens coming from these widely separated localities. Those from the American coast differ from the European in having a slight increase in the convexity of the carapace, with coarser granulations over its surface. The teeth of the front are also much more prominent. In the European specimens the projections of the front hardly amount to more than undulations; while in those from this side they are teeth-like. An increased development in the same direction is observed in the individual from the Hawaiian Islands. If what I have stated here should hold good through a large series of specimens, it will be an interesting instance of progressive development from east to west, where the difference in the local conditions are less pronounced than from north to south in corresponding degrees of longitude.

ASSECLA, *nov. gen.*

Carapace convex, broader than long, smooth and shining; front broad, produced, broadly triangular; antero-lateral and postero-lateral borders nearly equal in length; the latter converging posteriorly; antero-lateral border five-lobed; hiatus at the internal angle of the orbit completely closed by a process from the base of the external antenna; the movable part of the antenna excluded from the hiatus; a process from the front descends to meet the process from the base of the external antenna. The third joint of the external maxillipeds longer than broad at the base; broader at the base than at the apex, irregularly quadrilateral; inner angle of the base somewhat projecting. A prominent ridge on the palate; the ridge is not produced to the anterior margin of the buccal area. Basal article of the external antennæ large, nearly longitudinal. Arm not projecting beyond the carapace; hand short, carinated; tarsus of the posterior pair of legs flattened, subovate, or lanceolate-ovate; very slightly modified into a swimming apparatus.

In respect to the development of its natatorial feet this genus bears the same relation to *Lissocarcinus*, as *Carcinus* does to *Platyonichus*.

ASSECLA HOLOTHURICOLA, *n. sp.*

Carapace broader than long, surface smooth and shining; the antero-lateral and postero-lateral borders very nearly of the same lengths; front broad, produced, broadly triangular, on a higher level than the antero-lateral border, and continuous with the superior margin of the orbit; anterior margin somewhat sinuous; the antero-lateral border thin, everted, five-lobed; second lobe the broadest; the free margins of the lobes straight; the angles slightly rounded; the divisions separated only by fine incisions; the gastric region of the carapace elevated; the antero-lateral parts much excavated. The lateral projection at the junction of the antero- and postero-lateral borders more tooth-like than lobular, and more projecting than the other lobes, thick and obtuse; a high, prominent ridge running from its apex, at first, inward and slightly backward, and then inward and forward on the swollen portion of the carapace, terminating abruptly at the junction of the middle with the lateral third of the breadth of the carapace; a flattened, scarcely prominent ridge anterior to and parallel with the preceding, terminating at the bottom of the lateral sulcus. The prominent edge of the postero-lateral border converging posteriorly. The post-orbital angle of the first lobe not rounded, rectangular; a fissure on the superior margin of the orbit near the external angle; the inferior margin entire, finely granular; a fissure at the outer angle; the inner angle projecting as a prominent tooth. Areolations on the surface of the carapace indistinct; a shallow depression extending to the apex of the front, and on either side of this is a broad prominence (2 F and 1 M consolidated); 2 M and 3 M consolidated; 1 P slightly prominent. Central line of the body high and convex, sloping toward the sides, which are concave. The first and second joints of the external antennæ cylindrical; the apex of the second joint on a level with the frontal margin.

The third joint of the outer maxillipeds longer than broad; inner margin oblique; superior margin straight; angles prominent; irregularly rectangular in outline, broader at the base than at the top. Inferior regions finely pubescent; the pubescence only seen under the lens.

Hand strongly bicarinated on the superior surface; a well-marked ridge on the middle of the external surface; above the preceding is a flattened, nearly obsolete ridge; the inferior surface smooth; a high crest along the whole length of the upper edge of the movable finger; at the base of the crest, on either side, is a sulcus, extending the entire length of the finger; the inner and outer surfaces of both fingers deeply grooved; thumb slightly deflexed on the palm; apices of fingers pointed, beaked, and overriding when closed; cutting-edges strongly toothed; five prominent, conical teeth on each edge; sometimes two smaller ones between second and third, and third and fourth; carpus carinated above; two ridges on the external surface; an obtuse spine projecting from the anterior part of the inner surface; the ridges on the carpus sinuous; arm smooth, and not projecting beyond the lateral border of the carapace.

The posterior legs compressed; contracted at the articulation of the third and fourth articles; the fifth article and all the tarsi, except those of the last pair of legs, furrowed on their anterior and posterior surfaces; on the anterior surface of the tarsi the two furrows, the one above and the other below, separated by a prominent ridge, become continuous at the proximal extremity around the base of the ridge; the fifth joint and tarsus of the last pair compressed to a greater degree than the corresponding joints of the preceding legs; tarsus very much flattened, not grooved, oblong-ovate; apex corneous, hooked; a few short and fine hairs on the lower border of the tarsi; at the base of the tarsus of the last pair, and at the distal extremity of the fifth joint below, is a tuft of hairs.

Abdomen of female broadly ovate, and composed of seven pieces.

Color: The whole upper surface of the carapace purple, with the following exceptions: a narrow line of white around the entire free margin of the carapace, following the incisions between the lobes on the antero-lateral border; a round spot of the same color at the anterior superior angle of the orbit, and a short oblong spot, commencing at the apex of the front, extending its whole length; a round spot on the apex of the projecting lateral tooth, and another, similar, on the carapace just anterior to the termination of the lateral ridge. The arrangement of the colors on the legs is somewhat peculiar. Ground color purple; the distal extremities of the third and fifth joints, and the proximal end of the fourth, white. The purple color extends over the whole hand, except at the base of the movable finger, and on the palm opposite the articulation of the finger; the carinæ white; a ring of purple around the carpus; the proximal extremity white, and a spot of the same color on the distal end above; the upper surface of the arm purple.

Length, 0.45 inch; breadth, 0.56 inch; ratio of length to breadth, 1: 1.2

Locality: Palmyra Island, North Pacific. Taken from the cloacal dilatation of the alimentary tract of a *holothurian*. This is the first instance on record where a crustacean of the family *Portunidæ* has been found living as a "free messmate" in another animal. Others possessing this habit have belonged, without exception, to families much lower in the scale of classification. The elaborate system of coloration, and the asperities on the surface of the carapace of this crab, would incline us to believe that this is not its permanent place of residence. The *Pinnotheridæ* are devoid of color-markings, and their shell is more or less rounded, the irregularities of the surface being removed by the constant pressure to which it is subjected by the living walls of their dark abode.

Belonging to this new genus, and closely allied to the above, is *Lissocarcinus orbicularis*, Dana. The arrangement of the colors on the legs is almost identical in the two species; the general shape of the front is similar, and there is the same smooth and shining surface. The *holothuricola*, however, is readily distinguished by its being less orbicular, and more produced transversely, and by the prominent posterior tooth of the antero-lateral border. The third joint of the outer maxillipeds is straight, and almost quadrangular; in *orbiculare* its shape is more irregular. In the latter the antero-lateral margin is a "little reflexed," while in the former it is everted. The shape of the claws and ambulatory feet is the same in both species.

PODOPHTHALMUS VIGIL, (*Fabr.*) *Leach.*

Podophthalmus vigil, LEACH, Zoöl.Miscell., ii, pl. cxviii.—GUERIN, Icon. du Règne Anim. Crust., pl. i, f. 3.—M. EDWARDS, Hist. Nat. des Crust., i, 467; Règne Anim. de Cuvier, Crust., Atlas, pl. ix, f. 1.—DE HAAN, Faun. Japon., Crust., 44.—ALPH M. EDWARDS, Arch. du Mus. d'Hist. Nat. de Paris, 1860, x, 420.

Podophthalmus spinosus, LAMARCK, Syst. des Anim. sans vertèb., 152; Hist. des Anim. sans vert., v, 157.—LATREILLE, Gen. Crust. et Insect., i, pl. i et ii, f. 1; Hist. Nat. des Crust. et des Insect., vi, 54, pl. xlvi; Règne Anim. de Cuvier, iv, 33; Encyclop. Meth., x, 166.—DESMAREST, Considerat. sur les Crust., 100, pl. vi, f. 1.

Portunus vigil, FABRICIUS, Suppl. Entom. Syst., 368, no. 1.

Locality: Fanning Group of Islands, North Pacific.

MACROPHTHALMIDÆ.

OCYPODINÆ.

GELASIMUS GIBBOSUS, *Smith.*

Gelasimus gibbosus, SMITH, Trans. Connecticut Acad., vol. ii, 140, pl. ii, f. 1, et pl. iv, f. 8; Report of the Peabody Academy of Sciences, 1869, 91.

Locality: La Paz, Lower California.

OCYPODA CERATOPHTHALMA, (*Pallas*) *Fabr.*

Ocypoda ceratophthalma, Fabr., Suppl. Entom. Syst., 347.—Latr., Hist. Nat. des Crust., vi, 47; Encyclop. Meth., pl. 274, f. 1.—Desmarest, Consid. sur les Crust., 121, pl. 12, f. 1.—De Haan, Faun. Japon., Crust., 29.—M. Edwards, Hist. Nat. des Crust., ii, 48; Atlas du Règne Anim. de Cuvier, Crust., pl. 17, f. 1; Mélanges Carcinologiques, 105.—Krauss, Südafrik. Crust., 41.—Stimpson, Proc. Acad. Nat. Sci. Phila., 1858, x, 100.

Ocypoda brevicornis, M. Edwards, Hist. Nat. des Crust., ii, 48; Mélanges Carcinologiques, 106.—Dana, U. S. Expl. Exped., Crust., i, 326, pl. xx, f. 3.

Cancer ceratophthalmus, Pallas, Spicil. Zoöl. fasc., 83, pl. 5, f. 17.

Locality: Fanning Group, North Pacific.

GECARCINIDÆ.

UCAINÆ.

CARDISOMA OBESUM, *Dana.*

Cardisoma obesum, Dana, Proc. Acad. Nat. Sci. Phila., 1851, v, 252; U. S. Expl. Exped. Crust., i, 375, pl. xxiv, f. 1.—M. Edwards, Mélanges Carcinologiques, 171.—Stimpson, Proc. Acad. Nat. Sci. Phila., 1858, x, 100.

Cardisoma urvillei, M. Edwards, Mélanges Carcinologiques, 170.

Locality: Fanning Group. A lateral edge to the carapace is more apparent in the young and in females, than in the adult males. In the former there is a small point, or projection, behind the post-orbital angle. In the females the hands are shorter, the fingers are less attenuated, and their cutting-edges are more closely approximated, and evenly denticulated than in the males.

GRAPSIDÆ.

GRAPSINÆ.

METOPOGRAPSUS THUKUHAR, (*Owen*) *M. Edw.*

Metopograpsus thukuhar, M. Edwards, Annal. des Sci. Nat., 3re Sér. xx, 165; Mélanges Carcinologiques, 131.—Stimpson, Proc. Acad. Nat. Sci. Phila., 1858, x, 101.—Heller, Crust. Novara Exped., 43.

Goniograpsus thukuhar, Dana, U. S. Expl. Exped. Crust., i, 344.

Pachygrapsus parallelus, Randall, Jour. Acad. Nat. Sci. Phila., viii, 124.

Grapsus thukuhar, Owen, Crust. Beechey's Voyage, Blossom, 80, pl. xxiv, f. 3.

Locality: Hawaiian Islands.

PACHYGRAPSUS CRASSIPES, *Randall.*

Pachygrapsus crassipes, RANDALL, Jour. Acad. Nat. Sci. Phila., viii, 127.—M. EDWARDS, Melanges Carcinologiques, 132.—STIMPSON, Jour. Boston Sci. Nat. Hist., 1857, vi, 27; Proc. Acad. Nat. Sci. Phila., 1858, x, 102.

Locality: Lower California.

GRAPSUS RUDIS, *M. Edw.*

Grapsus rudis, M. EDWARDS, Hist. Nat. des Crust., ii, 87; Annal. des Sci. Nat., 3 re Ser. xx, 168; Melanges Carcinologiques, 134.—GIBBES, Amer. Assoc. Advan. Science, 1850, 17.—STIMPSON, Proc. Acad. Nat. Sci. Phila., 1858, x, 102.—HELLER, Crust. Novara Exped., 47.

Grapsus hirtus, RANDALL, Jour. Acad. Nat. Sci. Phila., viii, 124.

Locality: Fanning Group.

GEOGRAPSUS CRINIPES, (*Dana*) *Stimp.*

Geograpsus crinipes, STIMPSON, Proc. Acad. Nat. Sci. Phila., 1858, x, 101.—HELLER, Crust. Novara Exped., 48.

Grapsus crinipes, DANA, Proc. Acad. Nat. Sci. Phila., 1851, v, 249; U. S. Expl. Exped., Crust., i, 341, pl. xxi, f. 6.—M. EDWARD, Melanges Carcinologiques, 136.

Locality: Fanning Group. There is less concavity in the posterior border of the epistome in this specimen than is given in Dana's figure. This authority lays particular stress upon this point, but I deem it of minor importance. The specimen agrees in every other particular.

PINNOTHERIDÆ.

PINNIXIA TUMIDA, *Stimp.*

Pinnixia tumida, STIMPSON, Proc. Acad. Nat. Sci. Phila., 1858, x, 108.

Locality: Bellañas Bay, Lower California. Removed from the interior of the body of a *holothurian.*

Although separated by the entire width of the Pacific Ocean, yet this specimen agrees in every particular with the description given by Stimpson of a species from the port of Hakodadi, on the island of Jesso. *P. tumida* and *P. faba*, Dana, are the only species of this genus that are characterized by the absence of ridges on the superior surface of the carapace. There is nothing in Dana's description of his species, which came from Puget Sound, which would militate against this being the same; but in the plate a figure of the hand is given, in which the fingers are oblique, as in *tumida*, but there is no hiatus between them, and the tooth on the middle of the movable finger is wanting, both of which points are very characteristic of *tumida.*

The other species of crustacea which are common to both the Asiatic and American shores of the Pacific are *Trapezia maculata, Liomera lata, Liomera cinctimana* and *Pachygrapsus crassipes.* The latter, a subterrestrial crab, was obtained by Stimpson from the port of Simoda, Japan. The first three are littoral in their habits, and are Indo-Pacific species. On the American side all of these species have come, so far, from the Lower Californian coast only.

CALAPPIDÆ.

CALAPPA TUBERCULATA, *Fabr.*

Calappa tuberculata, FABRICIUS, Suppl. Entom. Syst., 345.—HERBST, Krabben und Krebse, 204, pl. 13, f. 78.—GUÉRIN, Iconog. Crust., pl. 12, f. 2.—M. EDWARDS, Hist. Nat. des Crust., ii, 106.—DANA, U. S. Expl. Exped. Crust., i, 393.—STIMPSON, Proc. Acad. Nat. Sci. Phila., 1858, x, 162.—HELLER, Crust. Novara Exped., 69.

Calappa hepatica, DE HAAN, Faun. Japon. Crust., 70.

Locality: Hawaiian Islands.

HIPPIDÆ.

BLEPHAROPODA OCCIDENTALIS, *Randall.*

Blepharopoda occidentalis, RANDALL, Jour. Acad. Nat. Sci. Phila., viii, 131, pl. vi.—GIBBES, Proc. Amer. Assoc. Advan. Sci., 1850, 187.—STIMPSON, Jour. Boston Soc. Nat. Hist., vi, 46; Proc. Acad. Nat. Sci. Phila., 1858, x, 230.

Albunhippa occidentalis, DANA, U. S. Expl. Exped. Crust., i, 405, 406.

Locality: Lower California.

PAGURIDÆ.

CALCINUS TIBICEN, (*Herbst*) *Dana.*

Calcinus tibicen, DANA, U. S. Expl. Exped. Crust., i, 457.—STIMPSON, Proc. Acad. Nat. Sci. Phila., 1858, x, 234.—HELLER, Crust. Novara Exped., 87.

Pagurus levimanus, RANDALL, Jour. Acad. Nat. Sci. Phil., viii, 135.

Pagurus tibicen, M. EDWARDS, Hist. Nat. des Crust., ii, 229; Atlas du Règne Anim. de Cuv., Crust., pl. 44, f. 3.

Cancer tibicen, HERBST, Krabben und Krebse, pl. 23, f. 7.

Locality: Hawaiian Islands.

CALCINUS LATENS, (*Randall*) *Dana.*

Calcinus latens, Dana, U. S. Expl. Exped. Crust., i, 459, pl. 28, f. 11.—Stimpson, Proc. Acad. Nat. Sci. Phila., 1858, x, 234.—Heller, Crust, Novara Exped., 88.
Pagurus latens, Randall, Jour. Acad. Nat. Sci. Phila., viii, 135.

Locality: Hawaiian Islands.

In alcoholic specimens the color of the carpus and anterior surface of the arm is red, with white spots. Some of the spots on the superior surface of the carpus are slightly elevated. In few of the specimens the red color of the carpus is very faint. The basal portion of the tarsi of the posterior legs, in some cases, is brownish-red, and in others purplish.

CLIBANARIUS ZEBRA, *Dana.*

Clibanarius zebra, Dana, U. S. Expl. Exped. Crust., i, 465, pl. 29, f. 5.—Stimpson, Proc. Acad. Nat. Sci. Phila., 1858, x, 235.

Locality: Hawaiian Islands.

CENOBITIDÆ.

CENOBITA OLIVIERI, *Owen.*

Cenobita olivieri, Owen, Crust. Beechey's Voy. Blossom, 84.—Dana, U. S. Expl. Exped., Crust., i, 470.—Stimpson, Proc. Acad. Nat. Sci. Phila., 1858, x, 232.—Heller, Crust. Novara Exped., 82.
Pagurus clypeatus, Olivier, Encyclop. Méth. Ins., viii, 643, pl. 311, f. 1.

Locality: Fanning Group.

We found this crab to be most abundant on Palmyra Island. They climbed the trees and bushes, dragging after them the heavy shell of the *Turbo argyrostoma*, which they use to the exclusion of all other shells. It is probable that they climb the trees for the purpose of feeding on the mosses and lichens that grow thereon.

CENOBITA PANAMENSIS, *Streets.*

Cenobita panamensis, Streets, Proc. Acad. Nat. Sci. Phila., 1871, xxiii, 241.
Cenobita intermedia, Streets, Proc. Acad. Nat. Sci. Phila., 1871, xxiii, 241.

Locality: Lower California.

When describing the type of this species in 1871, I stated that the tarsus of the third leg of the left side was shorter than the corresponding leg of the right side. As this difference is not observable in the present specimen, which agrees with *panamensis* in every other respect, it was doubtless nothing more than an individual variation. The tarsus of the third leg, left side, is slightly longer than that of the right side, which is the case in *C. intermedia.* The failure of the principal point of difference between the species necessitates their union under one name. I therefore retain *panamensis*, and reduce *intermedia* to the status of a synonym.

The color is better defined in the recent specimen. The external surface of the larger hand is brown, except at the superior margin and at the posterior inferior angle; the upper half of the external surface of the carpus, both sides, of the same color as the hand; the lower half uncolored, or slightly stained with orange; a large spot of orange on the anterior, truncated surface of the arm. The fourth article of the posterior legs is marked in the same manner as the carpus, with the addition of a deep line of purple at the lower edge of the brown, which extends from the center of the article to its articulation with the third article; a brownish, or purplish, spot at the base of the fifth article. This spot is wanting on the last leg of the left side. The third joint of the last pair is purplish; the tarsi brownish-orange. The carapace anteriorly purplish; two patches of the same color posteriorly on each side. The peduncles of the eye a deep buff.

Total length of the carapace 1.00 inch.

BIRGUS LATRO, *Leach.*

Birgus latro, LEACH, Trans. Linn. Soc., xii—M. EDWARDS, Hist. Nat. des Crust., ii, 246; Atlas du Règne Anim. de Cuv., pl. 43, f. 1.—QUOY & GAIMARD, Voy. de l'Uranie, pl. 80.—DANA, U. S. Expl. Exped. Crust., i, 474, pl. 30, f. 5.—STIMPSON, Proc. Acad. Nat. Sci. Phila., 1858, x, 232.—DARWIN, Naturalist's Voyage Around the World, 462.

Cancer latro, HERBST, Krabben und Krebse, ii, 34, pl. 24.

Cancer crementatus, RUMPHIUS, Mus., pl. 4.—SEBA, iii, pl. 21, figs. 1 et 2.

Locality: Washington, or New York Island, Fanning Group. Common. Confined to this one island of the group. At one time this giant land-crab was supposed to be restricted to a single group of islands in the Pacific, south of the equator; in recent times, however, its habitat has been widely extended, so that there is hardly a group, either north or south of the equator, where it is not found. They live in holes in the ground; and they line the bottoms of their burrows with the fine fibers of the cocoanut-husk. The unwary native, in seeking to rob the crab of its soft bed, occasionally finds his fingers imprisoned in its vise-like grip. It is interesting to know that in such an emergency a gentle titillation of the under soft parts of the body will cause it to immediately loose its hold. So tenacious is their grasp that I have seen them hang suspended from a tree for more than an hour, holding on to a stick which had been thrust between their claws. The wonderful stories about these crabs climbing the trees after cocoanuts are purely fictitious. They eat the nuts after they have fallen to the ground, first stripping off the husk, and then breaking through the shell at the end containing the eyes.

CRANGONIDÆ.

CRANGON FRANCISCORUM, *Stimp.*

Crangon franciscorum, STIMPSON, Proc. California Acad. Nat. Sci., 1856, i, 89; Jour. Boston Soc. Nat. Hist., 1857, vi, 495, pl. 22, f. 5; Crust. and Echin. Pacific coast of N. Amer., 55.

Locality: San Francisco Bay, California.

PALÆMONIDÆ.

HIPPOLYTE GIBBOSUS, *M. Edw.*

Hippolyte gibbosus, M. EDWARDS, Hist. Nat. des Crust., ii, 378.—DANA, U. S. Expl. Exped. Crust., i, 565, pl. 36, f. 4.—HELLER, Crust. Novara Exped., 120.

Locality: Hawaiian Islands.

There are seven teeth along the under margin of the rostrum, instead of six, which is the number given by Dana.

PALÆMON ACUTIROSTRIS, *Dana.*

Palæmon acutirostris, DANA, U. S. Expl. Exped. Crust., i, 590, pl. 39, f. 1.

Locality: Hawaiian Island.

SERGESTIDÆ.

SERGESTES MACROPHTHALMUS, *Stimp.*

Sergestes macrophthalmus, STIMPSON, Proc. Acad. Nat. Sci. Phila., 1860, xii, 46.

Locality: North Pacific Ocean.

There is no doubt about the identity of this species. It is very easily identified by the arrangement of the spines on the cephalothorax and abdomen. In addition to the supra-orbital and hepatic spines, there is one on the middle of the dorsal surface of the carapace, at its posterior extremity; this spine is small and erect. There is an oblique spine on the posterior dorsal extremity of the fourth, and of the fifth abdominal segments; that on the fourth is the larger. No other species of this genus presents this peculiar arrangement of dorsal spines. But Stimpson makes no mention of spines on the other segments of the abdomen. They were evidently broken off in his specimen, as they are on some of the segments of the present specimen, which, however, shows a greater number than he states to be present. No evidence of spines were seen on the first and second segments; but at the posterior extremity of the dorsal surface of the third is an erect spine, similar to the one on the posterior extremity of the carapace. The sixth segment has an oblique spine at its extremity, which is smaller than those on the two preceding segments. An unmutilated specimen will doubtless show the first and second segments to be armed with erect spines similar to that on the third, and on the extremity of the carapace.

SERGIA, *Stimp.*

Sergia, STIMPSON, Proc. Acad. Nat. Sci. Phila., 1860 , xii, 46.

In certain of its characters *Sergia* recalls *Lucifer*; while in others it is strongly related to *Sergestes*. Its own peculiar characters are in its fourth and fifth pairs of feet, which are long; and the dactylus is palmiform. Its body is elongated like *Lucifer*, but not so attenuated, and there is the same extension of the antennary segment anterior to the buccal region, which is carried to so great a degree in *Lucifer*. And again, as in the latter genus, there is a spheroidal auditory body imbedded in the base of the peduncle of the internal antennæ.

SERGIA REMIPES, *Stimp.*

Sergia remipes, STIMPSON, Proc. Acad. Nat. Sci. Phila., 1860, xii, 46.

Carapace very much elongated, depressed, subcylindrical; a lateral view shows nearly the same vertical diameter from the front to the extremity of the sixth abdominal segment; the cervical suture distinct; the length of the antennary segment anterior to this suture equals more than half the length of the carapace proper; no hepatic spine. Front slightly projecting and broadly rounded; the outer angles, over the eyes, rounded and projecting, shorter than the front. Eye subfungiform, short, its length less than one-third the length of the carapace; it extends very little beyond the apex of the basal article of the peduncle of the inner antennæ. Antennary scale broad, extending nearly midway the last joint of the antennary peduncle; inner margin and apex furnished with closely-set plumulose cilia; a spine on the outer margin below the apex.

The second and third pairs of external maxillipeds pediform, elongate; the three terminal joints of the second pair thickened, bent backward; the third pair very long, exceeding the length of the thoracic feet, and extending anteriorly to about the apex of the inner antennary peduncle. The maxillipeds, and the six anterior thoracic feet, furnished with long, simple setæ. The fourth and fifth pairs of thoracic feet slenderer than the preceding, cylindrical, more sparsely furnished with setæ; setæ plumulose; dactylus flattened, subovate; fifth pair shorter than the fourth; fourth almost as long as the carapace. Abdominal feet long and narrow; first pair nearly as long as the carapace; the length of the peduncle almost equals the length of the rami; the length of the feet decreases posteriorly, while the diameter of the peduncle increases; the margins of the rami densely covered with long, plumulose cilia. Abdomen longer than the cephalothorax; the five anterior segments subequal; the sixth long, equals the lengths of the fourth and fifth combined; fifth unarmed above; the posterior margin of the sixth, above and below, acute; inferior border furnished with long, plumulose cilia. The external margin of the outer caudal lamella armed with an aculeate spine near the posterior extremity. The margins of all the caudal appendages, except the external margin of the outer lamella anterior to the spine, furnished with long, equidistant, feathery cilia.

A comparison of the above description with that given by Stimpson shows that they agree in every particular, except in the length of the eyes—which he distinctly states reaches to the apex of the penultimate article of the antennary peduncle—and in the character of the front. Concerning the latter, he says, "rostrum minutely spinous, acute, curved, dorsum armed with a tooth or spine." Neither the spine nor the spiniform rostrum, are observable in the present specimen. The eyes were somewhat shrunken, and the front was probably mutilated in the surface tow-net in which the animal was caught. When the author states that the spines are minute, in a specimen only a half an inch long that requires a microscope to examine any part of its structure, they must be exceedingly small, and are very apt to be broken off by the rush of the water through the net. If these differences are found to be constant, this will constitute a distinct species; but I am not willing to found it upon the examination of a single specimen.

Locality: North Pacific Ocean.

Caught June 28, 1873, in latitude 30° north, longitde 145° west.

LUCIFERIDÆ.

LUCIFER ACESTRA, *Dana.*

Lucifer acestra, DANA, U. S. Expl. Exped. Crust., i, 671, pl. 44, f. 9.

Locality: North Pacific Ocean.

Male caught June 28, 1873, in latitude 30° north, longitude 146° west; female, May 9, 1873, in latitude 4° north, longitude 127° west.

After an examination of the genus *Sergia* there is no longer any doubt in my mind, that the place for *Lucifer* is with the lower Macroura rather than with the Schizopoda. The propriety of even elevating it to the dignity of a separate family is questionable.

I make the following addition to the characters already pointed out as distinguishing the sexes of this species. In the females the extremity of the internal margin of the outer caudal lamella projects beyond the apex of the spine at the extremity of the external margin; in the male this margin is not produced at all, but is truncated. The truncated surface is rounded, and slopes forward and inward from the base of the spine.

EUPHAUSIDÆ.

EUPHAUSIA GIBBOSA, n. sp.

Carapace short rostrate; rostrum broad, triangular, on a lower level than the superior surface of the carapace; the superior surface behind the rostrum gibbous, elevated slightly above the rest of the surface. Inner antennæ three-jointed, about three times as long as the eye; the first joint as long as the second and third together; its apex above produced into a long spine, which reaches half the length of the following joint, and directed upward and somewhat forward; the apex of second joint also produced, but spine shorter and directed more forward; second and third joints subequal; a tuft of long hairs at the apex of the last joint; the flagellum long, and with antenna about as long as the body. The antennary scale oblong, as long as the base of the antenna; the apex furnished with long, curved cilia; flagellum of the outer antenna about as long as that of the inner pair. The feet slender; the last three joints longer than the one next preceding; the penult and antepenult subequal; the ultimate a little more than half the length of the penult; the setæ long and plumulose; the palpus about one-third the length of the leg, those on the anterior legs longer. Branchiæ ramose. The sixth abdominal segment as long as the two preceding; the caudal segment longer than the lamellæ; the two subapical barbs salient.

The tumid, hunched appearance of the anterior portion of the carapace, and the spines at the apices of the first and second basal joints of the inner antennæ, are characters which have not been mentioned in any previously-described species of this genus. They are very characteristic of this species, and will serve readily to distinguish it from all others.

Length, .45 of an inch.

Locality: North Pacific Ocean. Latitude 30° north; longitude 145° west. Caught June 28, 1873.

CYRTOPIA ROSTRATA, *Dana*.

Cyrtopia rostrata, DANA, U. S. Expl. Exped. Crust., i, 648, pl. 43, f. 2.

Locality: North Pacific Ocean. Latitude, 3° north; longitude, 128° west. Collected May 10, 1873.

Several specimens of this species were obtained, and they are all more rudimentary in form than that described by Dana. I failed to detect the slightest evidence of branchiæ. These organs were rudimentary in Dana's specimen; and in another genus—*Furcilia*, which is very closely allied, and more rudimentary still—they are entirely absent. In one instance the carapace was excavated behind, across the dorsum, as in the latter genus. All the specimens, but one, showed the apex of the first joint of the inner pair of antennæ prolonged at its outer and inner angle beyond the summit of the following joint, to about the same extent as it is carried in some species of *Furcilia*. The abdominal feet were rudimentary. The gibbous eyes, the long acute beak, and the anteriorly projecting tooth on the lateral border of the carapace were present in all. The facts cited above add greater weight to the testimony already adduced, that the place for Dana's provisional genus *Furcilia* is near *Cyrtopia*, in the family *Euphausidæ*.

MYSIDÆ.

MYSINÆ.

SIRIELLA GRACILIS, *Dana*.

Siriella gracilis, DANA, U. S. Expl. Exped. Crust., i, 658, pl. 44, f. 1.

Locality: North Pacific Ocean. Latitudes 20° and 30° north; longitudes 149° and 145° west. Collected May 19 and June 28, 1873.

In all the specimens collected, the abdominal appendages were well developed, with stout oblong bases, and with two subequal, multiarticulate, ciliate rami, somewhat longer than the base. There is also present an oblong scale at the apex of the basal portion of the first pair of antennæ. Both these characters are said by Dana to be wanting; and their presence assimilates the genus more closely with *Promysis* and *Macromysis*.

COROPHIIDÆ.

CLYDONINÆ.

CLYDONIA LONGIPES, *Dana*.

Clydonia longipes, DANA, U. S. Expl. Exped. Crust., ii, 835, pl. 55, f. 7.—SP. BATE, Cat. Amphi. Crust., 284, pl. xlvii, f. 9.

Locality: North Pacific Ocean. The exact locality was lost.

The specimen in our collection is unmutilated; and, consequently, shows those parts intact that Dana stated were wanting in his. Concerning the antennæ, he says: "Only two were observed, and these were long, straight, stout, rigid organs, lying side by side, and, excepting the basal joints, hardly articulated, or only indistinctly so." The presence of but two antennæ was not an anomalous condition, but an accidental one, owing to mutilation. Commenting on the above statement, Sp. Bate says: "The author does not state which pair of antennæ are absent. The superior pair are probably rudimentary." Our specimen shows two pairs of antennæ occupying their normal positions, and those described by Dana are not the inferior, but the superior pair.*

The inferior pair are longer, and more slender organs than the superior, and are folded upon themselves, and partly hidden under the body. They arise from the under and outer surface of the first segment of the cephalothorax, posterior and external to the superior pair. The first basal joint is short and stout, more than twice the breadth of the second, which is oblong in shape and longer than the first; the third article is cylindrical, half the breadth of the second and twice as long. At its articulation with the second basal joint, it is bent obliquely upward between the basal portion of the superior pair. The flagellum is very long, and attenuated toward its extremity, multiarticulate. It extends forward to near the middle of the superior pair, where it is folded back upon itself beneath the body. The apex of the flagellum reaches nearly to the posterior extremity of the cephalothorax when in this folded condition. The total length of the inferior pair is one-third greater than the superior pair.

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* I will state, for the benefit of future collectors in this field, that my collection was preserved unmutilated by mounting the specimens, as soon as caught, in cells upon glass slides.

The other parts that were mutilated in Dana's specimen were the posterior stylets. A description of these will therefore complete the account of the entire animal.

The outer caudal lamella are longer than the inner; both are lanceolate in shape, and serrated along their edges. The two stylets terminating the caudal segment are linear, and of the same length as the outer caudal lamellæ. Two short stylets articulate with the outer edge of the first just above the middle, and reach exactly half way to the terminal point. The fifth and sixth abdominal segments are much narrower than the preceding, and are apparently consolidated.

HYPERIDÆ.

HYPERINÆ.

LESTRIGONUS RUBESCENS, *Dana.*

Lestrigonus rubescens, DANA, U. S. Expl. Exped. Crust., ii, 984, pl. 67, f. 9.—SP. BATE, Cat. Amphi. Crust., 290, pl. xlviii, f. 5.

Locality: North Pacific Ocean. Latitude 1° north; longitude 122° west. Collected May 7, 1873.

My reasons for retaining the genus *Lestrigonus* will be given under *Hyperia tricuspidata.*

HYPERIA TRICUSPIDATA, n. sp.

Head large, deeper than broad, irregularly quadrangular from a lateral view, excavated in front. Eyes large, occupying most of the lateral portion of the head. Superior antennæ shorter than the head, stout; base short, four-jointed; first joint longest, distal end enlarged; the second, third, and fourth short, together shorter than the first; flagellum broader than the peduncle, oval, acute at the apex, about three times as long as the base, uniarticulate; a few long auditory cilia at apex; a single row of short hairs on the inferior surface. Inferior antennæ rise from the inferior portion of the head, near the buccal region; more than twice as long as the superior pair; peduncle four-jointed; first and second joints long; first about half the length of the second, extending to the anterior margin of the head, but not exposed beyond it; second joint slender, cylindrical, and the entire length of its upper border closely set with short, equidistant hairs, curled at their tips; third and fourth joints short, subequal, about one-quarter the length of the second, a few hairs on their upper surface; flagellum linear-lanceolate, in length almost equal to the second joint of the base, uniarticulate, pointed, with seven or eight slight serrations along the superior edge, one or more hairs at each serration. The second joint is directed upward and outward, and the third, fourth, and flagellum are bent downward, nearly at a right angle with the second. When the animal is at rest, the inferior antennæ are evidently folded up, in this manner, in the concavity in the front of the head.

The two pairs of gnathopoda unequal and unlike; the first pair shorter, and more robust than the second; meros produced antero-inferiorly, at its extremity a number of stiff hairs, slightly curled at their tips; carpus broad, produced inferiorly, but not anteriorly, with its anterior edge straight, and armed at the inferior angle with two stout spines or bristles; propodus shorter than the carpus, and about one-half as broad; dactylus very minute. The second pair has none of the joints produced; meros short, about one-fourth the length of the carpus; the latter slender and cylindrical; propodus shorter than the carpus, and about the same breadth, with its distal extremity slightly produced on either side of the dactylus to an acute point, which is almost as long as the short dactylus. This arrangement probably compensates for the lack of the subchelate development of the carpus.

The depth of the thorax decreases slightly posteriorly. The five pairs of thoracic feet subequal; the two anterior pairs directed forward, with the last two joints flexed backward; the three posterior pairs directed backward, with the tarsus and claw flexed forward; a few short hairs set equidistant along the posterior margin of the two anterior, and on the anterior margin of the three posterior, pairs of legs.

The peduncles of the anterior abdominal appendages broadly elliptical, decreasing in size posteriorly. Of the three posterior pairs of abdominal appendages the ultimate are the longest; the preceding pairs nearly subequal; the rami of the antepenult (external) the longest, of the ultimate pair the shortest; rami serrated. Telson short, lanceolate.

Another specimen, a female with an incubatory pouch attached containing young, was captured at the same time as the one just described; and while the two differ widely in some respects, they have in common the essential specific character that immediately distinguishes *H. tricuspidata* from all others of the same genus; namely, the peculiar structure of the second pair of gnathopoda. The head is larger in the female, but the general shape is the same; the thorax is shorter and deeper, and the last segment is much narrower; the abdomen is also narrower. The character of the superior antennæ is the same in both, except that in the female they are much smaller, and the joints are more plainly visible. The inferior antennæ, however, are quite different. They do not extend at all, or very slightly, beyond the anterior margin of the head. The first basal joint is very short, and broader than the following; the second long, and reaches nearly to the anterior margin of the head; the third joint is rudimentary; and the fourth is apparently obsolete. The flagellum is small, about one-third the length of the first joint, lanceolate in shape, and with two or three stout cilia at its apex. The shortening is chiefly due to the diminished length of the first joint of the peduncle. The posterior pair of thoracic legs are slenderer and shorter than the preceding pairs. The peduncles of the anterior abdominal appendages are ovate, instead of being elliptical; the posterior appendages show no differences.

Length of male .30 inch; of female, .25 inch.

I cannot think that these differences are anything more than sexual, on account of the strong specific resemblance there is between the specimens. Carcinologists generally have adopted the conclusion that *Lestrigonus* is the male sex of *Hyperia*, but at no time, I think, has there been sufficient evidence at hand to justify this conclusion. I know no better reason for the supposition, than that they are occasionally found associated together, joined with the fact that certain others of the *Hyperidea* show a similar sexual difference; namely, in the length of the antennæ. In the *Lestrigonus*, however, there is not only a difference in the length, but a total change in the structure of the antennæ. What is here held to be a male bears no resemblance to a *Lestrigonus*, but has all the generic characters of a *Hyperia;* and, while there is a modified growth, as in the former genus, the development of the antennæ is the same in both individuals.

Young.—Head narrow, quadrilateral. Superior antennæ short and stout, and situated nearer the superior margin of the head than in the adult; the first basal joint as long as the three terminal ones; the second longer than the third, and their breadth less than that of the first; the fourth joint small, and either rounded or broadly triangular, with rounded apex; flagellum minute, linear, uniarticulate, with one or two cilia crowning the apex, as long as, or longer than, the flagellum. The inferior antennæ are represented by a small rounded tubercle, tipped by a cilia; situated just beneath the superior pair.

Thoracic feet ten in number, stout; claws strongly hooked. Gnathopoda rudimentary, neither pair produced at the carpus, or at the meros; readily distinguished from the following thoracic feet by their more slender development.

Locality: North Pacific Ocean.

VIBILINÆ.

VIBILIA EDWARDSI, *Sp. Bate.*

Vibilia edwardsi, SP. BATE, Cat. Amphi. Crust., 300, pl. xlix, figs. 6 and 7.

Locality: North Pacific Ocean. Latitude 4° north; longitude 127° west. Collected May 9, 1873.

The flagellum of the superior antennæ, with its anterior margin oblique, and fringed with a row of short spines, is highly characteristic of this species.

PHRONIMIDÆ.

PHRONIMINÆ.

PHRONIMA PACIFICA, n. sp.

Head large, broad and rounded on the top, tapering below to the oral apparatus, and excavated in front. Eyes both on the dorsal and lateral surfaces of the head. Thorax narrower than the head, its vertical diameter decreasing rapidly posteriorly; the last segment much longer than any of the preceding segments. Abdomen attenuated. Superior antennæ shorter than the head, two-jointed; first joint short; the second about twice as long as the first, with a few cilia at its apex. First pair of gnathopoda having the meros produced, and with the inferior margin furnished with minute spinules, one of which, larger and longer than the rest, at the apex; the superior border of the carpus arched, produced antero-inferiorly, and very slightly anteriorly; produced part not reaching half the length of the propodos; the anterior margin closely set with acute, triangular teeth; one at the inferior apex, long and slender; the inferior margin finely serrated; propodos about the same length as the superior border of the carpus, cylindrical, arctuate, slightly tapering toward the distal extremity, finely serrated on the inferior surface, and three or four longer spines on the superior surface; dactylos short, about one-fourth the length of the propodos, curved, and notched on the under surface, posterior to the apex; on either side of the base is a wing-like plate. The second pair of gnathopoda longer than the first pair, and the antero-inferior angle not produced to the same extent; in other respects they are similar. The first pair of thoracic feet shorter than the second, and much longer than the gnathopoda; the posterior margin of the carpus and propodus of both pairs minutely spinulose; dactylus minute. The third pair chelately developed; carpus large, irregularly quadrilateral, almost as broad as long, the inferior surface rounded, and the antero-inferior angle produced as a long tooth; on the middle of the anterior surface is a large crenulated tubercle, from which rise five or six long, straight hairs. In specimens from the .15 to the .20 of an inch long, there are, in the position of the tubercle, two or three sharp, prominent teeth, springing from a slightly-raised base; and the angle of the carpus is less projecting in the same specimens. Propodus bowed; when flexed on the carpus reaching to the apex of the tooth at the inferior angle—in smaller specimens somewhat longer; a low convexity on the inferior surface opposite the crenulated tubercle of the carpus; the prominence not crenulated; inferior surface bimarginate. Dactylus present, minute. The posterior apex of the coxa of the third pair acute, prominent; the meros projecting posteriorly and rounded. The two posterior pairs of thoracic feet subequal, shorter than any of the preceding pairs. Telson rudimentary.

Length of the larger specimens, .40; smaller, .15 of an inch.

Locality: North Pacific Ocean. Latitudes 4° and 21° north; longitudes 127° and 151° west. Collected May 9 and 20, 1873.

This species is distinguished from *P. sedentaria* by the broadly-quadrate form of the carpus of the third pair of thoracic feet, and by having the carpus of the gnathopoda less produced anteriorly. In other respects they are similar. The shape of the hand more nearly resembles the hands of *P. custos* and *P. borneensis*; but it is distinguished from both of the latter, by the character of the anterior surface of the carpus and of the propodus. In the latter both the carpus and propodus are furnished with a crenulated tubercle; in *custos* the tubercle is single and tooth-like. There is a striking resemblance between the propodus, and the anterior surface of the carpus of the third pair of thoracic feet, of the smaller specimens of *pacifica*, and the corresponding parts of *P.*

atlantica, which is said to be the female of *sedentaria;* the broad hand, however, separates them.

It is a remarkable fact, that in all the species of *Phronima* that have been described, even from widely-separated localities, the variation is very slight indeed.

ANCHYLONYX, nov. gen.

Head moderately large, broad and rounded at the top, tapering inferiorly to the oral apparatus, and excavated in front. Eyes on the lateral and dorsal surfaces of the head. Both pairs of antennæ present, long; base of the superior pair long and stout, three-jointed; inferior pair slender, four-jointed; flagellum very attenuated and elongated. Thorax broad, somewhat compressed; segments six. Abdomen narrow. The gnathopoda not subchelate, nor much reduced in size, when compared with the following feet; the first and second pairs of thoracic feet long, slender; carpus and meros linear. The third pair enlarged; carpus and meros dilated, with the anterior margin armed with teeth; propodus flexes on the carpus, impinging against the teeth on its anterior margin; dactylus fused with the propodus. The fourth and fifth pairs of feet subequal, shorter than the preceding. The three posterior pairs of abdominal appendages biramous, lanceolate; rami pointed.

This genus is very closely allied to *Phronima*. It differs only in the character of the antennæ, the gnathopoda, and in the less perfectly developed chelæ of the third pair of thoracic feet. The shape of the head, the thorax, and the abdomen are almost identical, and there are likewise eye-facets on the dorsal surface of the head. The mandibles are without appendages; and the first and second, and the fourth and fifth pairs of thoracic feet are similar to those of the genus above named, as are also the three posterior pairs of abdominal appendages. A pair of wing-like plates exist at the base of the dactylus of both pairs of gnathopoda. These, I believe, have previously been peculiar to *Phronima*. The character of the gnathopoda and the third pair of thoracic feet allies the genus with *Primno;* in the structure of its antennæ it differs essentially from both.

Anchylonyx forms a bond of union between the two subfamilies of Bate's—the PHRONIMIDES and PHROSIMIDES, which are founded upon the structure of the three posterior pairs of abdominal appendages in the different genera representing the family PHRONIMIDÆ. In his arrangement he separates *Primno* from *Phronima*, which, together, constitute Dana's subfamily PHRONIMINÆ. The fact that the two genera come together again, and mingle their characters in *Anchylonyx*, rather proves that the position which Dana assigned to them is the correct one, and that the characters which he used for the subdivision of the family are of more importance, than those adopted by Bate.

ANCHYLONYX HAMATUS, n. sp.

Head of moderate size, rounded above and pointed below, deeply concave in front. The lateral lenses of the eye arranged in the form of a rosette, and situated in a rounded projection on the lower portion of the head, directly above the origin of the inferior antennæ. A number of solitary lenses scattered over the lateral and dorsal surfaces of the head, and connected by long and filamentous nerve-fibers with the inferior eyes. The superior antennæ nearly as long as the cephalothorax; first joint of base short and broad; second extremely short, about one-third the length of the first; third joint slightly longer than the head, lanceolate, inferior edge densely hairy, apex inferiorly produced; first and second joints of the flagellum subequal, together about as long as the third; third and fourth subequal; remainder of flagellum lost. Inferior antennæ more slender than the superior pair, very long; flagellum very much attenuated, filamentous, one-half, or more than one-half, the length of the body; peduncle four-jointed—three of which are exposed beyond the anterior margin of the head; first joint short and broad; second longer than the rest, slightly oval; fourth narrower, bent slightly upward; joints of flagellum elongate—the first the longest; the remainder subequal. The under surface of the flagella of both pairs furnished with long, equidistant hairs.

Segments of the thorax six; the first and second soldered together; the five anterior subequal; the sixth (the seventh normal) narrows posteriorly, and is nearly as long as the two preceding. First pair of gnathopoda shorter and slenderer than the second; meros of the same length as the preceding joint, slightly produced inferiorly at the distal extremity—the produced portion finely serrated below and anteriorly, at the angle one of the serrulations produced to a fine acicular spine; carpus long, at inferior apex a slender spine; propodos somewhat shorter than the carpus, arched; dactylus about one-half the length of the propodos, arched, acute, notched below the apex, with a wing-like plate on either side of base. The carpal and meral joints of the second pair of gnathopoda neither produced, nor spiniferous; dactylus less than one-half the length of the propodos; with these exceptions the second pair is similar to the first. First and second pairs of thoracic feet longer than the third; the first pair longer than the second; the external surface of the coxæ ridged along the middle, with posterior angles acute, spinous; all the joints narrow and elongate; claw anchylosed with the tarsus, and fixed at a right angle to it; the apex of the tarsus produced in the form of a long, straight, acute spine. The third pair of thoracic feet enlarged, more robust than the others, with coxa ridged on the middle of the external surface, and with the anterior and posterior margins armed with short, stout spines; meros slender, convex posteriorly, and anteriorly concave; anterior surfaces of the carpus and meros armed with long, sharp teeth—three on the latter, and seven on the former; the fifth tooth, counting from the base oft he carpus, much larger and longer than the others; carpus somewhat clavate in shape, the anterior extremity enlarged; propodus about half the length of the carpus, arched; dactylus small, anchylosed, fixed at a right angle to the propodos. Fourth and fifth pairs of feet sub-equal, shorter than the preceding, with the anterior angles of coxæ spinous; in other respects similar to the preceding.

Abdomen narrow; the three anterior segments gradually diminishing in length posteriorly; the fourth very narrow. The peduncles of the anterior appendages broadly oval; the rami short and slender, multi-articulate; the posterior appendages slender, lanceolate, biramous, acute; the outer pair extending half way the rami of the terminal pair; the inner pair short, terminating at the commencement of the rami ot the outer pair. Telson minute, rudimentary.

Length, .40 of an inch.

Locality: North Pacific Ocean. Latitude 34° north; longitude 150° west. Collected June 25, 1873.

PHROSININÆ.

ANCHYLOMERA THYROPODA, *Dana.*

Anchylomera thyropoda, DANA, U. S. Expl. Exped. Crust., ii, 1004, pl. 68, f. 10.—SP. BATE, Cat. Amphi. Crust., 325, pl. lii, f. 6.

Locality: North Pacific Ocean.

I identify this species with Dana's, which came from the Atlantic Ocean, on account of the peculiar form of the antennæ. These organs are curved downward and outward, and are closely applied to the surface of the head. In one specimen the antennæ were absent altogether;

and I, therefore, do not believe their small size and peculiar form to be due to age; their presence is rather a sexual characteristic.

The inferior distal angle of the propodos of the third and fourth pairs of thoracic feet is produced, and when the joint is flexed this projection impinges against the antero-inferior angle of the carpus. This character is not mentioned in Dana's description. In other respects they are almost identical.

Length, .10 to .15 of an inch.

PLATYSCELIDÆ.

PLATYSCELUS BATEI, n. sp.

Head, when viewed from above, broadly rounded; the center of the anterior margin produced in the form of a beak, which is directed downward. The peduncle of the superior antennæ truncated; the inferior distal extremity furnished with two bunches of auditory cilia, one posterior to the other; flagellum two-jointed. Inferior antennæ short, four-jointed; first joint the longest; second and third subequal; fourth joint broadly rounded at apex, longer than the third; terminating in a minute flagellum, acute and curved at the apex, and base broader. The whole antenna is concealed beneath the lateral portion of the head. The thorax narrower at either extremity than in the middle, somewhat barrel-shaped when seen from above; first and second segment short, almost concealed in the middle of the dorsum by the overriding of the third. The first pair of gnathopoda shorter and slightly stouter than the second; in other respects they are similar; shorter and more robust than the following thoracic feet; neither carpi nor mera produced anteriorly, the latter broader than the former, neither serrated; the inferior margins furnished with a few long setæ; propoda about the same length as the carpi, narrower, cylindrical, not serrated; dactyla short. The first pair of thoracic feet shorter than the second; coxæ of both pairs elongate, somewhat clavate; the mera, carpi, and propoda subequally long; dactyla short, curved. Coxa of third pair subelliptical, not serrated; apex obtusely rounded; anterior margin furnished with five or six short, equidistant setæ; the remaining five joints articulating with coxa subapically, together as long as the coxa; at the inferior apex of the third joint is a single long seta. Coxa of the fourth pair broad, arcuate posteriorly, and excavate anteriorly; distal extremity obtusely rounded at the apex, and oblique posteriorly; the ischium short, articulating with the posterior margin of coxa near the center, and opposite the angle formed by the posterior oblique margin; the remaining joints about one-third the length of the coxa; the first joint following the ischium longer than the three terminal ones; the inferior margin produced anteriorly; all finely serrated on the posterior margin. Of the fifth pair the coxa only developed; membranous, broad, about one-third the length of the coxa of the fourth pair. Abdomen narrower than the thorax; segments gradually decreasing in breadth posteriorly; longer than the thoracic segments. Posterior abdominal appendages foliaceous, biramous; the details of their structure similar to those of *P. rissoinæ.* Telson broadly triangular, apex obtuse.

Length, .12 of an inch.

Locality: North Pacific Ocean. Latitude 21° north; longitude 151° west. Collected May 20, 1873.

This species is closely related to *P. rissoinæ;* the differences are chiefly in the structure of the gnathopoda, and of the third and fourth pairs of thoracic feet. The gnathopoda bear a striking resemblance to those of the young of *P. serratus,* but as the rest of the structure of the animal shows no evidence of immature development, this is undoubtedly their normal adult condition.

I dedicate the species to the eminent English carcinologist, C. Spence Bate, who, more than any other writer on the subject, has helped to elucidate this order of Crustacea.

AMPHIPRONOË SERRULATA, n. sp.

Head rounded; superior surface slightly convex, longer than the inferior surface; antero-inferior angle obliquely rounded, less projecting than the antero-superior; front hollowed; eyes diffused, covering the greater portion of the lateral surfaces of the head. Superior antennæ short, peduncle three-jointed; the third joint large, slightly produced antero-inferiorly; inferior surface convex, and densely covered with long hairs; flagellum articulating with superior margin of third joint subapically, triarticulate, having at the apex of each articulus two or more long auditory cilia. Inferior antennæ five-jointed, folded four times, and concealed beneath the head; first three joints subequal; fourth about two-thirds the length of the preceding; fifth very short; margins of all the joints shortly ciliate. The three anterior segments of the thorax narrower than the following; the four posterior subequal, gradually increasing in length posteriorly. First pair of gnathopoda having the meros broad distally; carpus broad, antero-inferiorly produced nearly to the apex of the propodos; the apex of the produced portion obtuse, finely serrulated on both margins; propodos oblong-ovate, slightly longer than the produced angle of the carpus, inferior margin serrulated; dactylus short. Second pair of gnathopoda longer than the first; carpus produced inferiorly, but not anteriorly; antero-inferior angle obliquely rounded and sharply serrated; propodos longer than the carpus, the superior margin arcuate, inferiorly straight, not serrated; dactylus half the length of propodos, slender, arcuate. First and second pairs of thoracic feet long, all the joints following the coxæ closely serrated along their flexible margins; claws long, slender, acute, almost as long as the preceding joint. Third pair having coxa dilated, and anterior margin nearly straight, the posterior broadly convex; the remaining joints, resembling the corresponding joints of the first and second pairs, longer than the coxa, and articulating with its apex near the anterior angle. Fourth pair having the coxa more dilated than the third, form similar; the remaining joints shorter than the coxa, but with the flexible margins serrated like the preceding pairs; the coxa of the fifth pair broad, much smaller than the two preceding; ischium rudimentary; the remaining joints obsolete. Segments of the abdomen much longer than those of the thorax, decreasing in length and breadth posteriorly; the posterior lateral angles of the three anterior segments produced, acute; the fourth and fifth segments do not coalesce; the fifth is extremely abbreviated, but distinct; on account of its small size the antepenultimate and penultimate caudal lamellæ appear to rise together from the postero-inferior angle of the fourth segment, but in reality they do not; the penultimate pair rises from the fifth; these lamellæ are subequal, with peduncles short and rami long, extending almost to the extremity of the ultimate pair, ovate-lanceolate, acutely serrated on both margins; peduncles of ultimate pair very short, rami similar to the preceding, extending a short distance beyond the extremity of the telson. The latter triangular, apex obtuse.

Length, .15 of an inch.

Locality: North Pacific Ocean. Latitude 21° north; longitude 151° west. Collected May 20, 1873.

OXYCEPHALIDÆ.

OXYCEPHALUS TUBERCULATUS, *Sp. Bate.*

Oxycephalus tuberculatus, Sp. Bate, Cat. Amphi. Crust., 343, pl. liv, f. 5.

Locality: North Pacific Ocean. Latitude 5° north; longitude 128° west. Collected May 10, 1873.

Although taken in a widely-distant locality, there is no doubt of the identity of this species with that described by Bate. The row of dorsal tubercles, one anterior and one posterior, on each segment of the body, the structure of the second pair of gnathopoda, and the rudimentary character of the posterior pair of thoracic legs—falling short of the base of the preceding pair—at once determines the species. They also agree in the minor details of structure, as far as they are given by the author. The head and first thoracic segment were wanting in his specimen. I will therefore supply the omission in his description by an account of the parts as they exist in the present specimen.

Head not quite as long as the first five segments of the thorax, broad, inferior margin broadly convex; rostrum more than half the length of the head, triangular, acute; eyes large, covering the whole of the lateral surfaces of the head; the superior antennæ broad, compressed; peduncle three-jointed; first joint longer than the second; the latter short; the third longer than the first and second, and having on the upper surface near the apex a few auditory cilia; flagellum uniarticulate, short, slender, slightly bent upward, and apex furnished with a few long auditory cilia. Inferior antennæ absent in the specimen. The first pair of gnathopoda shorter than the second, but similar to them in other respects; carpus produced anteriorly nearly to the apex of the propodos, margins furnished with a few long setæ, not serrated; propodos subovate; dactylus nearly half as long as the propodos. The flexible margins of the following thoracic feet furnished with a few setæ, or hairs.

Length, .40 of an inch.

LEPTOCOTIS, nov. gen.

Animal long and slender. Head large and produced anteriorly into a rostrum; narrowed behind the eyes; the constricted portion short, and not narrower than the thorax; under surface excavated anteriorly on each side for the reception of the superior antennæ. Superior antennæ short, sickle-shape. Inferior antennæ five-jointed, folded upon themselves four times, and concealed beneath the head; first and second joints distally enlarged. An elongate mandibular appendage. Gnathopoda short, and complexly chelate. Third and fourth pairs of thoracic feet having the coxæ dilated; the fifth pair small. Fourth and fifth abdominal segments fused into one; sixth small. Caudal appendages long, biramous. Telson cylindrical, long.

This genus exhibits a remarkable blending of the characters of *Oxycephalus* and *Rhabdosoma*. The general form of the animal is that of *Oxycephalus*; the short neck and elongated rostrum show a tendency toward *Rhabdosoma*. Both pairs of antennæ, the abdomen, and caudal appendages are identical with the corresponding parts in the latter genus; while the three posterior thoracic feet are a repetition of the former. A similarly elongated mandibular appendage is observed in *Rhabdosoma whitei.*

LEPTOCOTIS SPINIFERA, n. sp.

Head long, with the rostrum longer than the thorax; vertical diameter of the head greater posteriorly than anteriorly; the superior surface on a higher level than the dorsum of the thorax; abruptly constricted behind the eyes and in front of the first thoracic segment; the inferior border slightly convex; the under surface hollowed out on each side anteriorly in the form of fossæ for the reception of the superior antennæ; supra-fossal margin arched and slightly elevated; rostrum long, acute, slightly arched. Eyes covering the whole of the lateral and dorsal surfaces of the head posterior to the superior antennæ. Superior antennæ sickle-shaped; peduncle broad, three-jointed, with margins densely hairy, particularly the inferior margin; second joint short; the third longer than the first and second together, compressed, bent forward at its articulation with the second joint, and its anterior inner apex produced as a long, acute process, which is almost at a right angle with the main portion of the joint; base of process enlarged; flagellum articulating with the anterior surface of the base of the process, and shorter than the process, biarticulate, each articulus having three or four long auditory cilia. Inferior antennæ five-jointed, folded upon themselves four times, and hidden in a groove on the under surface of the head; the first, second, and third joints equal in length; the first and second enlarged at their distal extremities; fourth joint a little shorter than the preceding; fifth very short, with one or two auditory cilia at its apex. The mandibular appendage long, slender, reaching nearly to the apex of the first joint of the inferior antennæ; first joint long; second and third short.

Thorax seven-jointed; segments increasing in length posteriorly; epimerals long, broadly ovate, transversely rugose. Gnathopoda short, chelate; the second pair longer than the first; carpus of first pair scarcely produced anteriorly, anteriorly and inferiorly serrated; propodos broad, serrated on inferior margin; dactylus half the length of the propodos, arched, with a minute spine about the middle of the inferior surface, antagonizing with the extremity of the carpus. Second pair having the carpus more produced anteriorly than the first, extending to, or slightly beyond, the apex of the propodos, and terminating in a long, fine point; propodos and dactylus similar to the first pair. First and second pairs of thoracic feet shorter than the third, slender; third and fourth pairs having the coxæ dilated; the fourth more dilated than the third, and the remaining joints shorter, and closely serrated along the entire anterior margin—the first joint coarsely serrated, the next finely, and the third intermediate between the two preceding—the other feet not serrated; fifth pair rudimentary, coxa dilated, small, with the remaining joints not half as long as the coxa of the preceding pair.

Abdomen having the three anterior segments normal, subequal; fourth and fifth fused into one; sixth short; the dorsal surface of each segment marked by a shallow, transverse depression near the anterior extremity of the joint; that on the fourth segment deeper than those preceding it; a long, acute spine, pointing upward, on each side of the fifth, directly above the articulation of the outer caudal lamella. Caudal appendages long, cylindrical, serrated along their inner margins, biramous; outer pair longer than the two following; ultimate short, reaching further than the inner. Telson long, cylindrical, extending beyond the extremities of the lamellæ.

Length, .50 of an inch.

Locality: North Pacific Ocean. Latitude 29° north; longitude 157° west. Collected June 16, 1873.

CALANIDÆ.

CALANINÆ.

CALANUS SANGUINEUS, *Dana.*

Calanus sanguineus, DANA, U. S. Expl. Exped., Crust., ii, 1070, pl. 73, f. 11.

Locality: North Pacific Ocean. Latitude 21° north; longitude 153° west. Collected May 21, 1873.

CALANUS MUNDUS, *Dana.*

Calanus mundus, DANA, U. S. Expl. Expd. Crust., ii, 1071, pl. 74, f. 2.

Locality: North Pacific Ocean. Latitude 21° north; longitude 153° west. Collected May 21, 1873.

The specimens of *C. mundus* were taken at the same time with the *C. sanguineus.* A similar statement is made by Dana. The differences pointed out by that writer were observable in the present specimens, yet they probably have a closer relationship than he gives to them.

EUCALANUS ELONGATUS, *Streets.*

Calanus elongatus, DANA, U. S. Expl. Exped. Crust., ii, 1079, pl. 75, f. 1.

Locality: North Pacific Ocean. Latitude 1° north; longitude 122° west. Collected May 7, 1873.

The general shape of *E. elongatus* and *E. attenuatus* is so very different from the form of the typical *Calanus*, that I think we are justified in considering them under a distinct generic title. I adopt that which Dana suggested for *attenuatus*, in consequence of "the multiarticulate character of the smaller branch of the posterior antennæ." This character, I am disposed to believe, belongs to *elongatus* as well as to *attenuatus;* at least, a specimen examined by me shows unmistakable evidence of it.

PONTELLINÆ.

CANDACE ETHIOPICA, *Dana.*

Candace ethiopica, DANA, U. S. Expl. Exped. Crust., ii, 1115, pl. 78, f. 5.

Locality: North Pacific Ocean. Latitude 21° north; longitude 153° west. Collected May 21, 1873.

Our specimens differ from Dana's *ethiopica* in some respects, but they evidently do not constitute a new species. The cephalothorax is five-jointed, instead of four, the second joint being short; the right posterior angle of the last joint has a minute projection on its outer side near the apex. This projection was not observed on the left side, and it was only present in the single male specimen. The sixteenth joint of the anterior antennæ, or that one following the geniculation, presents both extremities closely pectinated, while there is a short space in the middle that is bare; the proximal extremity of the following joint shows a few short pectinations. The abdomen is five- or six-jointed, and on the right side of the first segment is an acute spinous process, black at the tip.

The female presents the following differences. There is no geniculation, nor pectinations, on the right anterior antenna; the acute posterior angles of the cephalothorax are produced equally, and bent slightly outward, the right not black at the tip. The abdomenis four-jointed; the second joint is the largest, rounded laterally and gibbous below, and the posterior lateral angle on each side is produced into short acute processes; in the center of the protuberance below is a deep black spot.

It will be observed that some of the characters mentioned above belong to *Candace curta.* The females show a decided likeness to the same sex of *C. pachydactyla.* The only difference of any importance that I can see in the three species, is in the structure of the right posterior foot of the male. Future research will probably determine them to be but a single species with individual variations. The structure of the right anterior antenna of the male is a strong specific character.

PONTELLINA DETRUNCATA, *Dana.*

Pontellina detruncata, DANA, U. S. Expl. Exped. Crust., ii, 1143, pl. 80, f. 7.

Locality: South Pacific Ocean. Latitude 10° south; longitude 110° west. Collected May 1, 1873.

PONTELLA FERA, *Dana.*

Pontella fera, DANA, U. S. Expl. Exped. Crust., ii, 1169, pl. 82, f. 5.

Locality: South Pacific Ocean. Latitude 23° south; longitude 94° west. Collected April 24, 1873. Specimen male.

CORYCÆIDÆ.

CORYCÆINÆ.

ANTARIA OBTUSA, *Dana.*

Antaria obtusa, DANA, U. S. Expl. Exped. Crust., ii, 1230, pl. 86, f. 13.

Locality: North Pacific Ocean. Latitude 5° north; longitude 128° west. Collected May 10, 1873.

The claw of the anterior feet is not as long as the preceding joint; the caudal stylets are about one-third the length of the abdomen, and the two external setæ, instead of being but little more than the diameter of the stylets in length, equal one-half, or more than one-half, their length.

COPILIA MIRABILIS, *Dana.*

Copilia mirabilis, DANA, U. S. Expl. Exped. Crust., ii, 1232, pl. 86, f. 14.

Locality: South Pacific Ocean. Latitude 8° south; longitude 113° west. Collected May 2, 1873.

The cephalothorax increases in breadth behind the conspicilla to about the middle of the first segment, where there is a slight angle. Posterior to this angle, the sides of the segment are very nearly parallel. Abdomen is five-jointed. The first and second articulations are nearly obsolete; the third and fourth distinct. The posterior extremities of the third and fourth joints are surrounded by a ring of minute spines; the fifth joint is slender, longer than all the preceding together; at each outer angle of the posterior extremity of the fifth joint is a short spine, and likewise one above and one below on each side. The caudal stylets are long and divergent, with a short, slender seta on their outer margin at the junction of the upper-fourth with the lower three-fourths of their length; the extremity is furnished with four setæ, those at the angles short and slender; the two middle ones long and stout.

SAPPHIRINA CORUSCANS, *Dana.*

Sapphirina coruscans, DANA, U. S. Expl. Exped. Crust., ii, 1243, pl. 87, f. 6.

Locality: North Pacific Ocean. Latitude 1° north; longitude 122° west. Collected May 7, 1873.

Body ten-jointed; the tenth small, concealed beneath the ninth. Caudal lamellæ having a tooth on the inner side near the apex. In this latter character it resembles *S. orientalis* and *S. ovalis*.

BOTANY.*

Plants of the Pacific Islands.

CRUCIFERÆ.

LEPIDIUM OAHUENSE, *Cham. & Schlecht.*

Localities: Palmyra and Washington Islands. Common.

MALVACEÆ.

SIDA DIELLI, *Gray.*

Locality: Christmas Island.

ZYGOPHYLLACEÆ.

TRIBULUS CISTOIDES, *Linn.*

Locality: Christmas Island.

SIMARUBACEÆ.

SURIANA MARITIMA, *Linn.*

Localities: Christmas and Palmyra Islands. Common on all the islands of the Fanning Group.

LUGUMINOSÆ.

CANAVALIA GLANDIFOLIA.

Locality: Washington Island.

FICOIDEÆ.

SESUVIUM PORTULACASTRUM, *Linn.*

Locality: Christmas Island.

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* Dr. Gray's paper has not been received up to the time of going to press; and we are, therefore, obliged to exclude the plants from the peninsula of Lower California from this Bulletin. An account of them will be published elsewhere.

GOODENOVIACEÆ.

SCÆVOLA PLUMIERA, *Vahl.*

Locality: Christmas Island. A low, spreading shrub, branching from the ground. Flowers white, with purple edges; resembling the flower of a *Lobeliaceæ.*

BORRAGINACEÆ.

HELIOTROPIUM ANOMOLUM, *Hook. & Arn.*

Locality: Christmas Island.

NYCTAGENIACEÆ.

BOERHAAVIA HIRSUTA, *Linn.*

Locality: Christmas Island.

CYPERACEÆ.

SCIRPUS RIPARIUS.

Locality: Washington Island. Covering the surface of the shallow fresh-water lagoons of that island.

FILICES.

POLYPODIUM AUREUM, *Sw.*

Localities: Palmyra and Washington Islands. Common.

PTERIS AQUILINA, var. CAUDATA, *Linn*

Locality: Oahu.

ASPLENIUM NIDUS, *Linn.*

Localities: Palmyra and Washington Islands. Very abundant on the windward side of the former.

ASPLENIUM POLYPODIOIDES, *Mett.*

Locality: Oahu.

NEPHROLEPIS EXALTATA, *Schott.*

Locality: Washington Island. Not growing on Palmyra.

DAVALLIA TENUIFOLIA, *Sw.*

Locality: Oahu.

DAVALLIA SPELUNCEA, *Baker.*

Locality: Oahu.

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